

# DEMOLITION SITE WASTE TASK FORCE

Senate File 2325



Report prepared by:

**Demolition Site Waste Material Task Force**

DECEMBER 2002

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EXECUTIVE SUMMARY .....	5
BACKGROUND .....	5
BUILDING MANAGEMENT DECISION HIERARCHY .....	5
RECOMMENDATIONS: SHORT AND LONG-TERM SOLUTIONS .....	5
DEMOLITION SITE WASTE TASK FORCE REPORT .....	7
BACKGROUND INFORMATION .....	7
SUMMARY OF TASK FORCE RESEARCH .....	7
FACTORS AFFECTING MANAGEMENT OF DILAPIDATED BUILDINGS .....	9
ECONOMIC FACTORS AND DISCUSSION: .....	9
ENVIRONMENTAL FACTORS AND DISCUSSION: .....	11
HEALTH & SAFETY FACTORS AND DISCUSSION: .....	13
SOCIAL FACTORS AND DISCUSSION: .....	14
WHAT OTHER STATES ARE DOING .....	15
DEMOLITION DEBRIS MANAGEMENT OPTIONS .....	15
REHABILITATING EXISTING BUILDINGS .....	16
MOVING OR RELOCATION .....	16
DECONSTRUCTION .....	16
SALVAGING .....	16
RECYCLING .....	16
FILL .....	16
BURYING .....	17
RECOMMENDATIONS .....	17
APPENDIX 1 - LEGISLATIVE MANDATE .....	25
APPENDIX 2 - AMOUNT AND TYPE OF CONSTRUCTION & DEMOLITION DEBRIS LANDFILLED IN IOWA ANNUALLY .....	26
APPENDIX 3 - LOCATIONS OF IOWA LANDFILLS .....	27
APPENDIX 4 - ULTIMATE AND PERMITTED CAPACITY AND TIPPING FEES OF IOWA LANDFILLS .....	28
APPENDIX 5 - SUMMARY OF OTHER STATES' REQUIREMENTS FOR TRAINING FIRES AND BURNING STRUCTURES .....	30
APPENDIX 6 - EXAMPLE OF A PERMIT FEE STRUCTURE ENCOURAGING WASTE REDUCTION AND RECYCLING .....	33
APPENDIX 7 - ASBESTOS PRESENTATION, IOWA DNR, SEPTEMBER 5, 2002 .....	36
APPENDIX 8 - AIR QUALITY CONCERNS PRESENTATION, IOWA DNR, SEPTEMBER 5, 2002 .....	39
APPENDIX 9 - LEAD-BASED PAINT PRESENTATION, IOWA DEPARTMENT OF PUBLIC HEALTH, SEPTEMBER 5, 2002 .....	43
APPENDIX 10 - "ASBESTOS CONTAINING MATERIALS," EPA REGION 6 WEB PAGE, MARCH 2002 .....	47
APPENDIX 11 - "DISPERSION MODELING OF EMISSIONS FROM BURNING OF RESIDENTIAL STRUCTURES" .....	48
APPENDIX 12 - "PARTICULATE MATTER – BACKGROUND AND HEALTH EFFECTS," EPA REGION 9 WEB PAGE, 1996 .....	52
APPENDIX 13 - HISTORICAL PARTICULATE POLLUTION TRENDS IN IOWA, IOWA DNR SUMMARY, DECEMBER 16, 2002 .....	54
APPENDIX 14 - AIR QUALITY INDEX EXCEEDANCES IN IOWA, 1999-2001 AND 2001-2002. ....	56
APPENDIX 15 - "LUNG CANCER, AIR POLLUTION" ASSOCIATED PRESS ARTICLE, MARCH 5, 2002 .....	57
APPENDIX 16 - LINKS BETWEEN AIR POLLUTION AND DEATH, HEALTH EFFECTS INSTITUTE REPORT, OCTOBER 24, 2000 .....	59
APPENDIX 17 - COMPARISON BETWEEN DEMOLITION AND DECONSTRUCTION COSTS .....	60
APPENDIX 18 - TASK FORCE MEMBERS .....	61



## EXECUTIVE SUMMARY

### *Background*

Iowa communities have a desire to rehabilitate or dispose of dilapidated houses, schools, churches, and commercial buildings as a means of spurring economic renewal and improving community safety. However economic, environmental, health, safety, and social barriers prevent the timely rehabilitation or disposal of less desirable structures. Until adequate incentives and information are provided to local decision makers these barriers will remain.

In response to the aforementioned challenges, the 2002 Iowa General Assembly established the Demolition Site Waste Task Force in Senate File 2325. The task force was directed to study issues related to the proper management and disposal of material from demolished buildings and provide a report to the general assembly by January 1, 2003. Economic, environmental, health, safety and social issues were reviewed to identify the best management practices for rehabilitating or disposing buildings.

The focus of Senate File 2325 is on burning structures for disposal. Thus a majority of the issues in this report relate to the environmental, health and safety risks of open burning. The burning of dilapidated buildings poses a significant risk to air quality and worker safety. The smoke and particulate released during the burning of buildings can exceed accepted air quality standards and guidelines. Certain populations in the community (such as asthma sufferers, the children and elderly) are at risk from smoke pollution and may require hospital visits after being exposed. The open burning of waste also decreases citizens' ability to enjoy their surroundings.

Prior to burning a dilapidated structure all asbestos containing materials must be removed, precautions must be taken to prevent lead exposure, Department of Natural Resources must be notified, firefighters have to receive proper training, and steps must be taken to ensure fire fighter safety.

### *Building Management Decision Hierarchy*

The task force developed a hierarchy of management options for dilapidated structures.

1. Rehabilitating building at current site
2. Moving building to a different location
3. Deconstructing to salvage building materials
4. Salvaging only select high-value materials
5. Recycling the building by grinding and sorting recyclable materials
6. Using rubble-like materials as fill
7. Disposal at a landfill
8. Burning for fire fighter training purposes
9. Burning

## RECOMMENDATIONS: SHORT AND LONG-TERM SOLUTIONS

Task force discussions focused on both alleviating and preventing the problem of finding economically and environmentally sound solutions for Iowa's aging building stock. The task force realizes that the current glut of dilapidated structures across Iowa requires an immediate solution. At the same time the task force strongly recommends that the legislature and Iowa communities seek long-term solutions to prevent a large number of dilapidated structures in the future. Presented here is a summary of the task force's recommendations to the General Assembly. More detail on each recommendation is available in the Demolition Site Waste Task Force report beginning on page seven and online at <http://www.iowadnr.com/waste/recycling/cnd.html>.

## **Short-Term Recommendations to Alleviate Glut of Dilapidated Structures**

- 1. A state and local partnership should be formed to explore the feasibility of establishing a mobile debris processing system in rural Iowa and if feasible conduct a pilot project**

- 2. Develop incentives for local reduction, reuse and recycling programs**

The Department of Natural Resources should work closely with the Iowa State Association of Counties and Iowa League of Cities to develop a framework of incentives for local solid waste agencies and local governments to establish reuse and recycling programs for construction and demolition debris.

- 3. Provide financial incentives and assistance to companies reusing or recycling construction and demolition materials**

Additional financial incentives are needed to increase the number of companies providing demolition debris management services and to stimulate the market for reused and recycled demolition materials.

- 4. Explore the use of corrections inmate labor on deconstruction projects and the training opportunities for providing inmates with construction job skills**

The use of local and state corrections inmates may enhance the economic feasibility of using deconstruction as a building disposal practice while providing job training skills to inmates.

- 5. Encourage Use of National Fire Protection Association Standards or Comparable Standard**

The state of Iowa, specifically the Department of Public Safety (Fire Service Training Bureau), should provide additional education to fire departments on how to conduct legitimate training fires and encourage use of the National Fire Protection Association 1403 Standard on Live Fire Training Evolutions or a comparable standard.

## **Long-Term Recommendations to Prevent Future Dilapidated Structures**

- 6. Review existing financial assistance programs by January 1, 2004**

All state and federal financial assistance programs related to new development, restoration or maintenance of buildings and funding of community infrastructure should be reviewed for opportunities to give a preference to the maintenance and restoration of existing structures.

- 7. The legislature should investigate providing additional state financial assistance for preventative maintenance and building rehabilitation activities**

The legislature should dedicate additional funding that will reduce the future disposal costs of dilapidated structures by encouraging maintenance and restoration of Iowa's buildings.

- 8. Adopt the United States Housing and Urban Development's Nationally Applicable Recommended Rehabilitation Provisions building code for rehabilitation projects (NARRP)**

One major hurdle preventing rehabilitation of Iowa's historic structures is the cost of complying with local building codes intended for new construction. The adoption of the NARRP would lower this hurdle.

- 9. Create a task force to study trends in landfill capacity and siting issues**

The legislature should create a task force to study existing landfill capacity, impending capacity problems and potential solutions for impending capacity problems, and report the findings by January 1, 2004.

- 10. Purchase an additional mobile fire training unit**

Mobile fire-training units provide a safer environment and a wider variety of training opportunities while at the same time reducing or eliminating the risks involved in burning buildings slated for demolition.

- 11. Open burning of demolition waste should be a last resort for disposal. In the short term, ensure all hazardous materials are properly removed prior to a training fire and safety provisions are taken during a training fire. In the long term pursue rescinding all demolition debris open burning**

The use of building demolition fires presents significant risks to the health of Iowans and the environment and should be a last resort.

# **DEMOLITION SITE WASTE TASK FORCE REPORT**

## **BACKGROUND INFORMATION**

Iowa has the third highest concentration of old housing stock in the country with 31.6 percent of houses built prior to 1940 according to the Iowa State University Census Office. Iowa communities have a desire to rehabilitate or dispose of dilapidated houses, schools, churches, and commercial buildings as a means of spurring economic renewal and improving community safety. However economic, environmental, health and safety and social barriers prevent the timely rehabilitation or disposal of less desirable structures. Until adequate incentives and information are provided to local decision makers these barriers will remain.

In response to the aforementioned challenges, the 2002 Iowa General Assembly established the Demolition Site Waste Task Force in Senate File 2325. The task force was directed to study the issues below related to the proper disposal of waste material from buildings demolished in cities and counties and provide a report to the general assembly by January 1, 2003.

- a. The proper removal and disposal of waste material containing lead-based paints and asbestos
- b. The proper removal and disposal of any other hazardous waste material or waste material commonly found in old buildings that may be considered a health hazard if removed improperly
- c. Any alternatives to the disposal of waste material from demolition sites such as salvage operations
- d. The training of fire department personnel in relation to the disposal of waste material from demolition sites
- e. Asbestos inspection training for volunteers at the local level
- f. An appropriate local limit for the controlled burning of demolished buildings from which hazardous materials have been removed prior to burning
- g. The proper method for encouraging cooperation between cities and counties on issues related to the disposal of demolition site waste material

The task force met three times between September and November 2002. Presentations were provided by experts on asbestos and lead-based paint inspection and removal, firefighter training, firefighter and demolition employee workplace safety requirements, air quality impacts of burning structures and demolition debris management options.

## **SUMMARY OF TASK FORCE RESEARCH**

The task force studied all of the issues directed by Senate File 2325 and outlined above. Here is a brief summary of the information researched and provided for each issue.

### ***a. – proper removal and disposal of waste material containing lead-based paints and asbestos***

The task force invited and received presentations from the Iowa Department of Public Health on the risks and management of lead-based paints and the Iowa Department of Natural Resources on the risks and management of asbestos. A more complete discussion of the proper removal and disposal and

associated health and environmental issues regarding asbestos and lead-based paint is provided in the Health and Safety Discussion section on page 13 of this report.

***b.- the proper removal and disposal of any other hazardous waste material or waste material commonly found in old buildings that may be considered a health hazard if removed improperly***

Iowa Workforce Development made a presentation to the task force on other hazards to workers that may exist in dilapidated structures such as furnaces and water heaters that may become explosive or projectiles during a fire or demolition.

***c. - any alternatives to the disposal of waste material from demolition sites such as salvage operations***

The task force analyzed the types and amounts of demolition debris in Iowa and managing that debris via burning, landfill burial, fill material, recycling, salvaging, deconstruction, building rehabilitation and building relocation.

***d. - the training of fire department personnel in relation to the disposal of waste material from demolition sites***

None of the current fire department personnel training programs by the Department of Natural Resources, Department of Economic Development and the Department of Public Safety address disposal of waste materials from demolition sites. While firefighters may typically inspect properties for asbestos and hazardous materials prior to conducting training fires, often times furnishings are left in structures to make the training situation more realistic.

***e. - asbestos inspection training for volunteers at the local level***

The Departments of Natural Resources and Economic Development completed asbestos inspector training for firefighters and other city personnel in September 2002. This training will serve as a valuable resource in developing future training opportunities.

***f. - an appropriate local limit for the controlled burning of demolished buildings from which hazardous materials have been removed prior to burning***

The task force received several presentations regarding the environmental and health risks associated with fires as a building disposal practice.

***g. - the proper method for encouraging cooperation between cities and counties on issues related to the disposal of demolition site waste material***

A representative from the Iowa State Association of Counties was added to the task force to compliment the Iowa League of Cities representative and enhance efforts to encourage cooperation between cities and counties. A representative from the Iowa Society of Solid Waste Operations that manages a county owned facility also served on the task force providing additional means to strengthen cooperation between cities and counties. Recommendation number two detailed on page 18 provides tremendous opportunities for city and county collaboration.

Economic, environmental, health, safety and social issues were reviewed to identify the best management practices for rehabilitating or disposing buildings. Here are some of the major issues researched and discussed by the task force.

**Economic Data:**

- League of Cities' community survey on extent of demolition site waste problem
- Amount of funding available for deconstruction
- Information on state incentives encouraging rehabilitation, restoration, and renovation of commercial buildings versus demolition or abandonment
- Information on state programs and amount of funding available for new construction versus rehabilitation, restoration, and renovation
- Concerns and interests insurance companies have from a casualty, health and life standpoint

**Environmental Data:**

- Solid waste planning area boundaries
- Number of landfills
- Number of municipal solid waste only landfills
- Number of landfills accepting municipal solid waste and construction & demolition debris
- Number of landfills with cells only for construction & demolition debris
- Number of landfills only accepting construction & demolition debris
- Number of landfills with less than 20 years of permitted capacity left
- Number of landfills with less than 20 years of ultimate capacity left
- Number of solid waste planning areas with less than 20 years of permitted capacity left
- Number of solid waste planning areas with less than 20 years of ultimate capacity left
- Tons of construction & demolition debris landfilled yearly
- Tons of construction & demolition debris that might be salvaged/recycled annually
- Percent of commercial demolition debris versus residential

**Health & Safety Data:**

- OSHA regulations for firefighters and demolition workers
- Smoke/particulate background information for the last 20-30 years

**Other Data:**

- How other states regulate training fires and the burning of demolition debris

## **FACTORS AFFECTING MANAGEMENT OF DILAPIDATED BUILDINGS**

***Economic Factors and Discussion:***

- Lack of landfill capacity in many areas
- Difficulty of regionalizing landfill services or siting a new landfill
- Cost of disposing of debris
- Fewer cost-effective alternatives may be available in rural communities
- Cost of maintaining rural rental properties exceeds the rental value of the property
- Problem goes beyond houses to include commercial buildings and schools
- Blighted buildings are left standing because it is cheaper than disposal
- Demand for housing exists in rural communities
- Perceived higher costs for rehabilitating buildings versus new construction

Determining an economically viable solution for maintaining or disposing of dilapidated structures is complicated by a variety of issues. According to the Iowa State University Census Office, Iowa has the third highest concentration of old housing stock in the country with 31.6 percent of housing stock built prior to 1940. Rural Iowa communities have seen a decrease in population resulting in houses and other buildings being abandoned, under utilized or managed by landlords outside of Iowa.

The Iowa League of Cities surveyed a select group of Iowa communities to determine how large of a disposal problem dilapidated housing is for Iowa communities. The survey also asked communities what method or methods they use to dispose of dilapidated buildings. Twenty-one Iowa communities responded with twelve communities indicating that a need exists for environmentally and economically disposal options for dilapidated structures in their community. These twelve communities with populations ranging from 260-3000 people identified a total of 86 houses in need of rehabilitation or disposal.

The cost to maintain homes and rental properties is often not recouped in sale prices or prevailing rental rates. Iowa communities lack funding and staff to implement and enforce proactive construction and property maintenance ordinances. Conversely, in communities where housing codes exist, these codes may drive up the cost for rehabilitation projects resulting in rehabilitation being a less economically viable alternative to new construction. Several state and federal funding programs make it easier to receive money for new construction than maintenance or restoration of existing properties which often contributes to the decay of existing properties.

The cost of properly removing all hazardous materials from buildings slated for demolition, demolishing the building, hauling the debris, and paying for disposal at the landfill is often greater than what communities are able to pay. A survey of data from 72 homes demolished for the Iowa Department of Transportation found that the average cost to demolish and dispose of each home was \$5,084 (see table 1). Developers also shy away from these disposal costs because the costs make recouping new construction costs more difficult and they often receive financial assistance to develop a new project on a previously undeveloped site. In addition, the total costs of new development projects such as roads, sewers, habitat impact, air pollution, loss of greenspace or cropland, schools, fire protection and police protection may not always be assessed to the developer.

**Table 1 – Average costs to dispose of a house using traditional demolition with landfill burial, a training fire or deconstruction.**

DISPOSAL METHOD	Average Cost Per Square Foot	Average Cost
Traditional Demolition with Landfill Burial	\$5.36 <sup>1</sup>	\$5,084 <sup>2</sup>
Training Fire	unknown	\$200-\$5,300 <sup>3</sup>
Deconstruction	\$3.19-\$6.47 <sup>4</sup>	Unknown

<sup>1</sup> Cost data is from “Building Deconstruction: Reuse and Recycling of Building Materials” report August 2000 by Center for Construction and Environment, University of Florida

<sup>2</sup> Average cost data for traditional demolition was derived from taking the Iowa Department of Transportation’s total cost to demolish and landfill more than 70 buildings and dividing the total cost by the number of buildings demolished.

<sup>3</sup> The low-end cost represents a fire department receiving volunteer services for training and using their own equipment. The high-end cost represents a department receiving 60 hours of Essentials of Firefighter I training and having one instructor from the Iowa Fire Service Training Bureau available during the live training for every five firefighters. (Note - Volunteer Firefighter Training Fund pays some of these costs.)

<sup>4</sup> The low-end cost represents the cost of deconstruction after selling the salvaged building materials. The high-end costs reflect just the cost to salvage and does not include any resale of materials salvaged.

The task force also discussed the potential impact that large community demolition projects can have on the disposal capacity of local landfills and the ability of the local solid waste agency to meet state waste

diversion goals. While the impact of large demolition projects on landfill space is of concern, the Department of Natural Resources does have mechanisms to address, on a case-by-case basis, the impact large demolition projects have on the ability of local solid waste agencies to meet state waste diversion goals.

### ***Environmental Factors and Discussion:***

- Environmental impacts of demolition, controlled and uncontrolled fires need to be compared.

The focus of Senate File 2325, passed in 2002, is on burning structures for disposal. Thus a majority of the issues discussed in this report relate to open burning. Environmental issues associated with rehabilitation or disposal of dilapidated structures must be considered to determine the best way of dealing with dilapidated houses and buildings.

Seventy-five percent of Iowa communities responding to an informal survey by the Iowa League of Cities identified training fires as the method used to dispose of dilapidated properties. In communities where training fires are not conducted, dilapidated buildings are typically demolished and landfilled. The burning of dilapidated buildings poses a significant risk to air quality and worker safety. The smoke and particulate released during the burning of buildings can exceed accepted air quality standards and guidelines. At risk populations in the community (such as asthma sufferers, the children and elderly) are at risk from smoke pollution and may require hospital visits. The open burning of waste also decreases the ability of citizens to go outside and enjoy their surroundings. Prior to the burning of a dilapidated structure all asbestos containing materials must be removed, the Department of Natural Resources must be notified, firefighters have to receive proper training and steps must be taken to ensure the safety of firefighters prior to igniting the structure.

Fire department personnel can benefit by conducting proper training fires, but in many cases the primary focus of burning a structure is cheap disposal with a secondary focus on training personnel how to fight fires.

Insurance companies have concerns about potential liability issues resulting from people entering and getting hurt in abandoned and potentially dangerous structures that are left standing. In addition there is concern regarding the inherent risks in improperly trained and prepared firefighters becoming injured or killed in a training fire or damaging other structures in close proximity to the training fire.

The task force determined that there are 60 landfills in Iowa accepting municipal solid waste and construction and demolition debris for recycling. In addition there are four landfills accepting only construction and demolition debris for a total of 64 landfills. The average landfill disposal charge for construction and demolition debris is \$34.18 per ton ranging from \$5-\$60 per ton.

Of the 64 landfills, 33 have 20 years or less of permitted capacity left. Nineteen of the landfills have 20 years or less of ultimate capacity. Ultimate capacity reflects the total amount of land that that landfill has left to develop (see appendix 4). An estimated 405,693 tons of construction and demolition debris is landfilled in Iowa annually which is equivalent to 16% of all solid waste landfilled. Following a moderately aggressive approach to recycling it's estimated that 70% or 285,320 tons of construction and demolition debris could be recycled (see table 2).

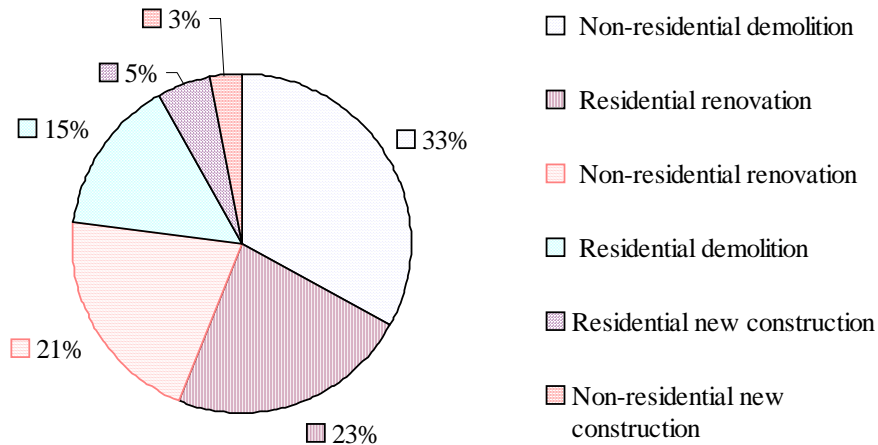
**Table 2 - Estimated amount of construction and demolition debris that could be recycled annually in Iowa by commodity type using a moderately aggressive approach to recycling.**

Commodity	Percent of Waste Stream	Percent of Commodity Estimated Recyclable Annually	Annual Tons Recyclable
Wood	105,480	75%	79,110
Dirt/Soil./Mud	93,309	100%	93,309
Roofing	60,853	75%	45,640
Concrete/Brick/Asphalt/Rock	28,398	100%	28,398
Drywall	28,398	10%	2,839
Metal	28,398	100%	28,398
Corrugated Cardboard/Paper	12,170	50%	6,085
Plastics	4,056	10%	405
Carpet	2,839	40%	1,136
Glass	1,217	0%	0
Miscellaneous	40,569	0%	0
<b>Total Tons</b>	<b>405,693</b>	<b>70%</b>	<b>285,320</b>

More than 90% of construction and demolition debris landfilled is estimated to be from renovation and demolition practices, and of that 38% comes from residential renovation and demolition (see figure 1).

**Figure 1 – Sources of Construction and Demolition Debris**

Source: Solid Waste Association of North America *Construction and Demolition Debris Certification Manual*



### ***Health & Safety Factors and Discussion:***

- Iowa has large amount of lead-based paint poisoning cases
- Old dilapidated buildings may become methamphetamine labs and drug houses
- Training fires present liability and safety issues
- Need training fire standards and safety guidelines
- Training fires are different than burning a structure for disposal
- Need to clarify what a bona fide training fire is and stress training aspect, not cheap disposal
- Some buildings are too deteriorated to remove shingles safely in preparation for training fires

Health and safety issues must be considered whether a blighted building is rehabilitated, salvaged, recycled or burned. Demolition contractors and firefighters must be cognizant of local, state and federal regulations protecting the health and safety of people involved in the demolition or controlled burning of a building. Firefighters have been killed when conducting training in improperly prepared or unstable structures. Responsible entities in these events have faced criminal charges.

### **Asbestos**

Asbestos is currently used in 3,000 materials. Asbestos fibers that enter the body are extremely small and can cause mesothelioma, lung cancer and colon cancer. The federal Asbestos Hazard Emergency Response Act (AHERA), the Occupational Safety and Health Act (OSHA) and the National Emission Standards for Hazardous Air Pollutants (NESHAP) govern the management and disposal of asbestos or the protection of workers dealing with asbestos. See appendix 10 for more information.

### **Lead-Based Paint**

Lead poisoning is identified by the Centers for Disease Control and Prevention as one of the most common and preventable pediatric health problems. Children get lead poisoning from lead-based paint most often by ingestion of peeling lead-based paint. Children may also be lead-poisoned by inhaling lead dust if they are in the work area while someone is sanding lead-based paint or removing it with a heat gun. Lead poisoning can stunt physical and mental development and at extremely high levels can cause death. The prevalence of lead poisoning in Iowa is three times the national average.

There are no state or federal regulations covering the removal of lead-based paint from a building unless it is done as part of a "lead abatement" project. In that case, contractors certified by the Iowa Department of Public Health must remove the lead-based paint. In Iowa the disposal of lead-containing waste is governed by the federal Resource Conservation and Recovery Act (RCRA) administered by the Environmental Protection Agency.

RCRA requires waste containing lead to be tested to determine how much lead it leaches. If the material fails the test, it must be disposed of as hazardous waste. If it passes, it may be disposed of as solid waste. Most lead-based paint chips and components painted with lead-based paint will fail the test unless these items are mixed with other building materials. In 2000, EPA issued an interpretation that states household waste is exempt from RCRA, meaning that components and paint chips removed from a residence can be treated as solid waste. The Iowa Department of Public Health has asked EPA whether this exemption also applies to a demolished residence, but has not received a response. Components and paint chips that are removed from buildings other than residences as well as the waste from these buildings when they are demolished must be treated as required by RCRA.

Contractors and homeowners involved in building rehabilitation have to be cognizant of hazardous materials that may exist in the home (e.g. asbestos and lead-based paint) and proper procedures to protect the health of workers and neighbors. Incorrect handling of hazardous materials may spread

contamination, increase the total costs for rehabilitation or disposal, and jeopardize the health of workers and surrounding citizens. Entire buildings initially slated for disposal in a local solid waste landfill have ended up being disposed of in a hazardous waste landfill at tremendous additional costs as a result of improper removal of lead-based paint or asbestos.

### **Impacts to public health from open burning**

Open burning of demolished structures produces air pollution that can be harmful to citizens residing in the community. Certain sensitive and at-risk groups are especially vulnerable to emissions from open burning. These groups include children, active adults, athletes, the elderly, and persons with respiratory diseases such as asthma, bronchitis or emphysema.

The smoke released from burning demolition debris contains fine particulate matter and carbon monoxide. Exposure to particulate matter pollution has been linked to premature death, aggravated asthma, chronic bronchitis, and decreased lung function.

The burning of demolition debris may also release dioxins/furans, smog-forming chemicals, and other toxics. Dioxins and furans are highly toxic at extremely low levels. Building materials that may release dioxins, furans and other air toxics, when burned, include: treated lumber, insulation, asphalt shingles, plastics, metals, carpet, flooring, varnishes and paints.

### **Exceptions to the ban on open burning**

Iowa has historically allowed some exceptions to the ban on open burning. Many of these exceptions, however, were created at a time when little information existed on the true health impacts of the pollutants released from open burning. In recent years, as more information has become available, the DNR has stepped up efforts to strongly discourage open burning. Many communities have followed suit, and have enacted bans on the burning of leaves, landscape waste, and residential waste.

### **Exceptions for training fires**

Conducting building burns for the purposes of bona fide firefighter training has been a long-standing exception to the ban on open burning. This exception was allowed because it was thought that the public benefit of well-trained fire department personnel outweighed the impacts of air pollution during the burning episode. Additionally, it was expected that training fires would be infrequent events, occurring only once every couple of years in a given community.

In recent years, fire training organizations, and some Iowa cities, are moving towards using burn trailers for firefighter training. The trailers can provide the needed training without the safety concerns of a building burn, and without the release of harmful air pollutants. Iowa's Fire Service Training Bureau will provide any community with use of the burn trailer (funding provided by the Volunteer Firefighter Training Fund).

### ***Social Factors and Discussion:***

The social issues involved in preventing, rehabilitating and disposing of dilapidated buildings may be the most complex. Social issues include, but are not limited to:

- Absentee ownership leading to more dilapidated structures
- Lack of community property maintenance ordinances
- Urban sprawl causing migration to the edge of town resulting in decay of town centers

- Increasing interest in town center revitalization has caused a need to demolish or extensively remodel some buildings

A 2000 study by the Public Policy Center at the University of Iowa entitled “Assessing Iowa’s Housing Needs: An Evaluation of Housing Policy at the Turn of the Century” determined that \$3 billion may need to be invested to address affordable housing issues in Iowa. Furthermore, the average wage earned by low-income workers is not sufficient to cover the costs of rental. Therefore renters and landlords may lack sufficient funds to properly maintain rental properties. The same University of Iowa study determined that 100,000 Iowans, or more than 3%, live in substandard housing or housing they can not afford. These 100,000 directly affected Iowans are evenly split with 50 percent being renters and 50 percent being homeowners.

Absentee landlords, who do not live in the same community or sometimes the same state as their rental property, can exasperate the problem of not properly maintaining rental properties. The landlord may not be aware of maintenance issues or lacks the community tie that can provide peer pressure to properly maintain rental structures. Furthermore, Iowa communities have few or no ordinances regarding property maintenance and a lack of staff to enforce building codes.

In an effort to encourage economic development, communities often look to new construction on previously undeveloped land near the edge of town. The types and amounts of financial assistance for these new developments are in greater abundance than financial assistance programs for maintaining or restoring existing structures. The result can be a town center that is no longer well maintained because buildings are abandoned as owners move to the fringe of the community or go out-of-business as a result of losing business to new developments.

Conversely, some Iowa communities have realized the increasing demand and potential for revitalizing their town squares and downtowns. However, in the process of revitalizing town centers sometimes the need arises to dispose of structures that have become too dilapidated to be rehabilitated, restored or moved.

## **WHAT OTHER STATES ARE DOING**

The task force received information from ten other states on how they are currently regulating the burning of structures and demolition debris. Each of the ten states reported that they do not allow structures to be burned other than for bona fide training fires. Some states were more stringent than Iowa in the materials they required to be removed from a structure prior to a training fire. A couple of states also have more stringent requirements on the number of training fires that can be conducted and the number of fire-fighting personnel that must be present during training. See appendix five for a summary of each state’s response.

## **DEMOLITION DEBRIS MANAGEMENT OPTIONS**

The task force examined the following options for managing demolition debris.

1. Rehabilitating building at current site
2. Moving building to a different location
3. Deconstructing to salvage building materials
4. Salvaging only select high-value materials
5. Recycling the building by grinding and sorting recyclable materials

6. Using rubble-like materials as fill
7. Disposal at a landfill
8. Burning for firefighter training purposes
9. Burning

### ***Rehabilitating Existing Buildings***

Rehabilitating an existing building can be a cost-effective and environmentally prudent solution. The cost-effectiveness varies from building to building and depends on several variables including, but not limited to, condition of the building, intended use of the building, market value for intended use, local financial and technical incentives, availability of skilled craftspeople, and the local building code.

### ***Moving or Relocation***

Relocation or moving buildings can be a cost-effective solution. The cost effectiveness of moving a structure is dependent on the condition of the structure, an available lot to move the structure to, the distance the structure must be moved, and the types of obstacles encountered while moving the structure (e.g. bridges, trees, power lines, overpasses). The Department of Transportation often provides bidders opportunities to purchase buildings for relocation that will be affected by transportation projects.

### ***Deconstruction***

Deconstruction is a process that demolition contractors have used on a limited basis for many years. Iowa has recently seen a growing interest in starting companies for the sole purpose of deconstructing buildings. Iowa currently has a few companies practicing total or partial deconstruction.

The University of Florida's Center for Construction and Environment recently compared the total cost of deconstructing six single family homes versus traditional demolition methods and found in each case that deconstruction was less expensive. See appendix 17 for more information.

### ***Salvaging***

Salvaging is similar to deconstruction, but instead of deconstructing the entire building, salvaging usually only involves salvaging items of high economic or architectural value. The number of Iowa building material salvage companies and retail stores for salvaged materials has grown in the past few years.

### ***Recycling***

The practice of recycling building materials by grinding the structure and using manual and automated sorting processes is very limited in Iowa, with the exception of the grinding and reuse of concrete and asphalt pavement products. Only one facility existed in Iowa with the capability to sort through large amounts of mixed or ground construction and demolition debris. That facility has closed in part as a result of poor market demand for some materials and regulatory compliance issues. Two facilities with the ability to sort loads of construction and demolition debris for recycling are anticipated to be open by the summer of 2003 in Scott and Polk counties.

### ***Fill***

The potential exists for rubble, such as concrete and brick, to be separated for reuse as fill material. This practice does take place on a limited basis with skilled demolition contractors knocking concrete or brick walls in one direction and the internal portions of the building in a different direction. By selectively demolishing a building in this fashion a contractor can often use the concrete and brick material as fill on the demolition site or can have the material ground as an aggregate.

### ***Burying***

All Iowa landfills accept demolition debris for disposal. However handling and compacting demolition debris is difficult. Demolition debris consumes more air space at a landfill than solid waste. Given the number of landfills in Iowa with 20 years or less of ultimate capacity the conservation of air space at landfills is a concern. In addition, construction and demolition debris comprises an estimated 16 percent of all material landfilled in Iowa and presents a major opportunity to meet state waste diversion goals.

### ***Burning***

Burning is a practice often used by Iowa communities for the disposal of dilapidated buildings. Burning may also provide valuable training for Iowa fire-fighting personnel. However, federal and state limits exist on when, where, how and what can be burned. This task force was formed in part to determine what limits, if any, should be placed on burning demolition debris from demolished dilapidated buildings. This method of burning provides very little training to Iowa's fire departments. In addition burning can cause serious risk to the environment and to the health and safety of firefighters and community residents.

## **RECOMMENDATIONS**

The task force recommends the general assembly adopt the following recommendations to address the short-term and long-term challenges of dilapidated structures.

### **Short-Term Recommendations:**

- 1. A state and local partnership should be formed to explore the feasibility of establishing a mobile demolition debris processing system in rural Iowa and conducting a pilot project***

A state and local government partnership should be formed to explore the establishment of a mutually beneficial regional mobile construction and demolition debris processing system.

A prototype mobile processing system developed by Cornerstone Material Recovery, Incorporated and Gershman, Brickner and Bratton, Incorporated recovered 70% of construction and demolition debris in a recent six-month demonstration project in Illinois. See photo below. More detailed information about this processing system is available by contacting Robert Brickner of Gershman, Brickner & Bratton, Inc at 703-573-5800.

A similar processing system could be jointly purchased and shared between several counties, cities and the state of Iowa. The local governments, a private contractor, or Iowa Prison Industries could operate the system.



**Costs - Initial purchase cost is estimated to be \$300,000. Annual operating costs, including transportation, maintenance, fuel and material sorters is estimated at \$200,000.**

## ***2. Develop incentives for local reduction, reuse and recycling programs***

The Department of Natural Resources should work closely with the Iowa State Association of Counties, the Iowa League of Cities, the Iowa Recycling Association and the Iowa Society of Solid Waste Operations to develop a framework that will provide incentives to local landfills or local governments to establish reuse and recycling programs for construction and demolition debris. Demolition debris management workshops to be sponsored by the Department of Natural Resources in the spring of 2003 will serve as an excellent opportunity to begin this collaborative effort and disseminate information on incentives programs to local governments.

The task force researched a variety of incentives that could be offered by local and state governments to encourage rehabilitation of dilapidated structures and prevent future dilapidated buildings. The Vacant Properties Network of the International City/County Management Association (ICMA) has produced a series of case studies on how Portland, Oregon; Richmond, Virginia; and San Diego, California have addressed dilapidated and vacant properties. ICMA's case studies are available online at <http://icma.org/IssueIntersections/vacantProperties.cfm>. While the amounts and types of incentives that could be offered are virtually limitless, the task force offers for consideration the following examples of state and local incentives.

### **Local Incentive Options**

1. Use general obligation bonds to establish a self-depleting fund for the purpose of buying homes for rehabilitation or demolition and then resell the property to payoff the bonds. (Indianola, Iowa uses general obligation bonds for this purpose. Contact Todd Kielkopf of the city of Indianola at 515-961-9410.)
2. Establish a tax abatement program for rehabilitation projects. (This strategy has been successful in Portland, Oregon. See [www.pdc.us/programs/hs/mf\\_reguide.html](http://www.pdc.us/programs/hs/mf_reguide.html). )
3. Encourage and provide incentives to building trades classes to practice rehabilitation instead of new construction. (The national Youthbuild program has done this successfully in other locations. Des Moines recently started a Youthbuild program focused on new construction. Contact Jackie Mitchell of the national Youthbuild program at 202-708-2290.)
4. Make greater use of tax increment financing for rehabilitation and redevelopment projects. (Portland, Oregon has used this strategy. See [www.pdc.us/programs/hs/mf\\_loans.html](http://www.pdc.us/programs/hs/mf_loans.html).)
5. Establish a recognition program for efforts that prevent burning or burying demolition debris.
6. Implement variable tipping fees and building related permit fees that establish a preference for activities other than the burning or burying of demolition debris.
7. Research and adopt proactive preventive maintenance ordinances.
8. Expand use of the Iowa Homesteading Program to encourage building rehabilitation. (This strategy has worked well for Baltimore, Maryland and Portland, Oregon.)

9. Encourage greater involvement by university engineers and architects in reviewing structures to determine feasibility of rehabilitation. (The HUD Office of University Partnerships at 800-245-2691 is a good resource).
10. Waive permit fees for rehabilitation and redevelopment projects. (Portland, Oregon has successfully used this incentive. See [www.pdc.us/programs/hs/mf\\_feeprog.html](http://www.pdc.us/programs/hs/mf_feeprog.html).)
11. Assess a monthly fine to property owners as long as there is an outstanding code violation at an abandoned property. (This is a successful strategy used by Portland, Oregon.)
12. Provide financial or technical assistance to conduct preliminary building inspections to determine the cost and feasibility of rehabilitation. (Des Moines has recently started a loan program for projects in the East Village to access engineering expertise to determine the cost of rehabilitating a building and the potential market for the rehabilitated building. Contact Jacqueline Nickolaus of the city of Des Moines at 515-283-4019.)
13. Provide tax abatement on the improved value of rehabilitated properties that rise in value by 20% or more. (Richmond, Virginia has used this incentive.)
14. Require a statement of intent and a project timeline within 30 days of the boarding up of a building. Make the lack of a statement of intent punishable by a \$250 quarterly penalty and/or misdemeanor criminal charge. (The city of San Diego has implemented this strategy.)
15. Eliminate tax deductions or abatements for any dwellings left unoccupied or abandoned for a certain length of time. (The city of San Diego has implemented this incentive.)

### **State Incentive Options**

1. Encourage cities and counties to use general obligation bonds to establish a self-depleting fund for the purpose of buying homes for rehabilitation or demolition and then reselling the property to payoff the bonds. (The city of Indianola has successfully used general obligation bonds for this purpose. Contact Todd Kielkopf of the city of Indianola at 515-961-9410.)
2. Implement a city tax credit program freezing property tax levels at pre-rehabilitation levels for 10 years. (This approach has worked successfully in Baltimore, Maryland.)
3. Establish a one-year abatement on taxes on land and improvements (renewed annually) for housing projects that are affordable to households earning less than 60% of area median income. (This strategy has worked in Portland, Oregon.).
4. Encourage greater use of tax increment financing for rehabilitation and redevelopment projects. (This strategy has worked in Portland, Oregon.)
5. Establish a recognition program for efforts that prevent burning or burying demolition debris.
6. Expand use of the Iowa Homesteading Program to encourage building rehabilitation. (This strategy has worked well for Baltimore, Maryland and Portland, Oregon.)
7. Eliminate tax credits such as the homestead credit for any dwellings left unoccupied or abandoned for a certain length of time. The city of San Diego eliminated tax deductions for dwellings left unoccupied or abandoned for at least 90 days.)

8. Encourage greater involvement by university engineers and architects in reviewing structures to determine feasibility of rehabilitation. (The HUD Office of University Partnerships at 800-245-2691 is a good resource).

### **3. *Provide financial incentives and assistance to companies reusing or recycling construction and demolition materials***

The Department of Natural Resources should continue the efforts started in fiscal year 2003 to seek proposals from projects involving the reuse and recycling of construction and demolition debris for its Solid Waste Alternatives Program (SWAP). SWAP provides forgivable, zero-interest and low-interest loans for projects that divert materials from Iowa landfills. For-profit, non-profit and public entities are eligible to apply.

The state of Iowa should eliminate the sales tax charged on reused building materials purchased from non-profit building material salvage and retail operations or set aside sales taxes from these retailers into a dedicated fund for rehabilitating buildings.

The pollution control property tax exemption should be expanded to include property and equipment directly involved in the reuse or recycling of construction and demolition debris with the possible exception of processing concrete or asphalt.

Iowa should provide construction and demolition contractors a tax credit for additional costs to recycle construction and demolition debris versus landfilling or legally burning the materials.

### **4. *Explore the use of state and local corrections inmate labor on deconstruction projects and the concurrent training opportunities for providing inmates with construction job skills***

The use of local and state corrections inmates may further enhance the economic feasibility of using deconstruction as a building disposal practice. Deconstruction preserves components of local history, provides job training skills to inmates, protects the environment and secures unique architectural as well as standard building components for local construction projects.

The Iowa Department of General Services successfully used inmates from the Newton Correctional Facility to salvage components from the Capitol Annex building. Likewise, the city of Rockwell City had success in using inmates from the Rockwell City Correctional Facility to deconstruct a local building.

Contact Roger Baysden of Iowa Prison Industries at 515-242-5705 or [roger.baysden@doc.state.ia.us](mailto:roger.baysden@doc.state.ia.us).

### **5. *Encourage Use of National Fire Protection Association Standards or Comparable Standard***

There is a lack of formal guidance for Iowa fire departments at this time related to preparing for and conducting live fire training exercises. The Iowa Department of Public Safety's Fire Service Training Bureau should provide continuing education to fire departments on how to conduct legitimate training fires and encourage use of the National Fire Protection Association 1403 Standard on Live Fire Training Evolutions or a comparable standard.

## **Long-Term Recommendations:**

### **6. Review existing financial assistance programs by January 1, 2004**

All state and federal financial assistance programs related to new development, restoration or maintenance of buildings and funding of community infrastructure should be reviewed for opportunities to give a preference to the maintenance and restoration of existing structures.

The task force recommends that a multi-agency working group carry out this task with the Department of Economic Development taking the lead for completing the task. The compilation of information gathered on all existing state and federal financial assistance programs and recommendations to modify these programs to place a greater emphasis on maintaining and restoring Iowa's existing infrastructure shall be placed on the Department of Economic Development's Web site.

One state contact either in the Iowa Housing Authority or the Iowa Department of Economic Development should be charged with maintaining comprehensive information on financial and technical assistance programs available for the maintenance and restoration of existing structures. The Iowa Housing Task Force also called for the consolidation of all state-funded housing programs into one agency as its number two priority recommendation in its December 2000 report "A Comprehensive Housing Strategy for Iowa." The specific recommendation is on page 31 of the Iowa Housing Task Force report at [www.ifahome.com/docs/HTF/report\\_final.pdf](http://www.ifahome.com/docs/HTF/report_final.pdf).

Entities seeking public incentives for a new development project should have to demonstrate that existing buildings are not available for the same purpose.

### **7. The legislature should investigate providing additional state financial assistance for preventative maintenance and building rehabilitation activities**

The legislature should investigate additional funding sources that will reduce the future disposal costs of dilapidated structures by encouraging maintenance and restoration of Iowa's buildings. The resulting investment in maintaining and restoring Iowa's building infrastructure will also have a positive impact on Iowa's critical housing shortage.

#### **➤ Establish a state wide derelict structures fund**

The state of Virginia has a state wide derelict structures fund that has previously been funded via a general fund appropriation. Contact Virginia Department of Housing and Community Development Deputy Director Shea Hollifield at 804-371-7030 for more information.

#### **➤ Increase the State Tax Credit for Rehabilitation of Historic Properties**

The state historic properties tax credit should be increased and transferable. The current level of tax credits is insufficient given the large potential for historic restoration projects in Iowa. The 2000 Iowa Housing Task Force also recommended increasing the tax credit. Recommendation number ten on page 38 of the Iowa Housing Task Force report recommended the cap on credits be increased from \$2.4 million annually to \$20 million annually at a minimum.

For more information on the Tax Credit for Rehabilitation of Historic Properties, visit chapter 404A of the Iowa Code at [www.legis.state.ia.us/IACODE/2001SUPPLEMENT/404A/1.html](http://www.legis.state.ia.us/IACODE/2001SUPPLEMENT/404A/1.html).

#### **➤ Create a housing trust fund**

A housing trust fund should be created and funded. A portion of the fund should be dedicated to maintenance and restoration. The creation of a housing trust fund was also recommended in "A Comprehensive Housing Strategy for Iowa," the December 2000 report from the Iowa Housing Task Force to the Governor. The housing report did not specifically recommend dedicating a portion of the trust fund for maintenance and restoration activities. The housing task force recommendation is on page 30 of their report at [www.ifahome.com/docs/HTF/report\\_final.pdf](http://www.ifahome.com/docs/HTF/report_final.pdf).

➤ **Establish a revolving loan fund**

A revolving loan fund should be created dedicated to rehabilitation, building relocation and disposal of buildings where rehabilitation is not possible.

There are several funding mechanisms that could be created to aid in the preventative maintenance and restoration of existing buildings. A portion of those funding mechanisms should be dedicated for the next 3-4 years to remove and dispose of structures that can not be rehabilitated. Portions of the funds could also be dedicated to the establishment of local ordinances and permitting programs that encourage preservation, restoration, recycling, and enforcement personnel on a regional level. Examples of potential funding mechanisms include the following.

**Potential Sources of Funding for Above Recommendations**

❑ **A surcharge on every new mortgage transaction**

A surcharge on every new mortgage similar to surcharges applied to vehicle registration renewals could be dedicated to a state fund for local programs to restore, maintain or dispose of demolition debris from local government sponsored projects. This funding mechanism may also be a way of offsetting revenue losses from increasing the state historic tax credit.

According to the United States Census Bureau, approximately 12,000 new homes are constructed in Iowa annually. To provide an example of the amount of revenue that could be generated by a surcharge on mortgage transactions if a \$50 surcharge was applied to each new residential mortgage the annual estimated revenue would be  $\$50 \times 12,000$  mortgages or **\$600,000**.

This is a conservative estimate as the surcharge should also apply to commercial construction. A \$50 surcharge on an average Iowa home costing \$100,000 is equivalent to .0005% of the total price. Another option to consider is to base the surcharge on a percent of the project's value instead of a flat surcharge.

***Revenue – Dependent on the amount of surcharge. See example above.***

❑ **Real Estate Transfer Tax**

The 2000 Iowa Housing Task Force report identified the Iowa Real Estate Transfer Tax as a potential source of funding for establishing a housing trust fund.

***Revenue – Annual revenue estimated at \$7 million by 2000 Iowa Housing Task Force***

❑ **Tonnage fee placed on every ton of construction and demolition debris landfilled**

Fee would be placed on construction and demolition debris currently exempt from the existing solid waste tonnage fee. The fee would be retained locally to aid in building disposal and developing and operating a local system for construction and demolition debris recycling.

**Revenue - \$1,091,701 would be generated by this tonnage fee**

**8. *Adopt the United States Housing and Urban Development's Nationally Applicable Recommended Rehabilitation Provisions building code for rehabilitation projects (NARRP)***

One major hurdle preventing rehabilitation of Iowa's historic structures is the cost of complying with local building codes intended for new construction. The adoption of the NARRP or other similar building code intended specifically for rehabilitation projects would lower this hurdle. The code is online at [www.huduser.org/publications/destech/narrp/toc\\_narrp.html](http://www.huduser.org/publications/destech/narrp/toc_narrp.html).

**9. *Create a task force to study trends in landfill capacity and siting issues***

The legislature should create a task force to study existing landfill capacity, impending landfill capacity problems and potential solutions to any identified impending capacity problems. The task force should report their findings to the General Assembly by January 1, 2004.

**10. *Purchase an additional fire training mobile unit***

Mobile fire-training units provide a safer environment and a wider variety of training opportunities while at the same time reducing or eliminating the risks involved in burning buildings slated for demolition.

The Iowa Department of Public Safety's Fire Service Training Bureau currently has one unit and has enough demand for a second unit. The Fire Service Training Bureau has a plan in place to greatly expand training opportunities if a second training unit becomes available.

**Cost - \$350,000 for one additional training unit.**

**11. *Open burning of demolition waste should be a last resort for disposal. In the short term, ensure that all hazardous materials are properly removed prior to a training fire and safety provisions are taken during a training fire. In the long term pursue rescinding all demolition debris open burning***

Senate File 2325 amended Section 455B.133 of the Code of Iowa to allow cities to conduct controlled burns on demolished buildings and required rulemaking to allow for these burns. For the reasons outlined in this section and throughout this report, however, the task force recommends that the general assembly consider in the long term rescinding the amendment allowing controlled burning of demolition debris. In the absence of a rescission, the task force recommends that the general assembly consider amending Section 455B.133 to further restrict the controlled burning of demolition debris.

The task force also advocates that the DNR, through rulemaking, establish specific conditions for allowing controlled burns, including, but not limited to conditions 1-6 below.

1. Review of all potential disposal options and justification that no other options were acceptable as an alternative to burning the building. The review of all disposal options should be based on environmental, economical, social, health and safety considerations.
2. Adopt city or county wide preventative maintenance ordinances
3. Adopt a construction and demolition permit fee structure that provides an incentive for reducing, reusing and recycling building materials
4. Have the property proposed to be burned reviewed for historical significance and if historical significance exists permission from the local or state historic preservation commission shall be received prior to proceeding with any burning or demolition
5. Prepare the building for the safety of firefighters
6. Properly remove and dispose of all hazardous materials from the structure

The task force also proposes that the Department of Natural Resources be allowed to develop a more manageable surrogate for the six-tenths-of-a-mile radius circle separation distance specified under Section 45, SF2325. In addition the state needs to develop specific guidelines to clarify what constitutes a bona fide training fire. Finally, the task force recommends that the legislature establish a deadline for phasing out training fires used only for the purpose of disposing of a building.

# APPENDIX 1

## LEGISLATIVE MANDATE

### Sec. 73, SF2325: DEMOLITION SITE WASTE MATERIAL TASK FORCE

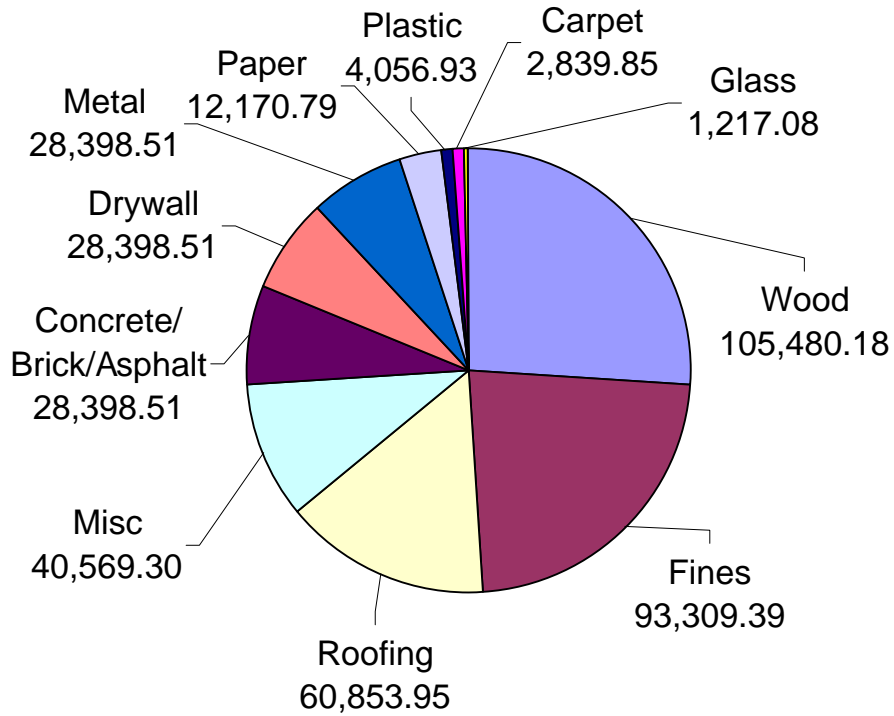
1. The department of natural resources, in cooperation with the department of economic development, shall establish a task force to **study issues related to the proper disposal of waste material from buildings demolished in cities and counties**. The task force shall study issues including, but not limited to, all of the following:
  - a. The **proper removal and disposal** of waste material containing **lead-based paints and asbestos**.
  - b. The **proper removal and disposal of any other** hazardous waste material or **waste material** commonly found in old buildings **that may be considered a health hazard** if removed improperly.
  - c. Any **alternatives to the disposal** of waste material from demolition sites such as salvage operations.
  - d. The **training of fire department personnel** in relation to the disposal of waste material from demolition sites.
  - e. **Asbestos inspection training** for volunteers at the local level.
  - f. An **appropriate local limit for the controlled burning** of demolished buildings from which hazardous materials have been removed prior to burning.
  - g. The proper **method for encouraging cooperation between cities and counties** on issues related to the disposal of demolition site waste material.
2. The task force membership shall include, but not be limited to, all of the following:
  - a. Representatives from the department of natural resources knowledgeable in air toxics and toxic materials.
  - b. Representatives from the department of economic development knowledgeable in community development.
  - c. A representative of the Iowa league of cities.
  - d. A representative of the Iowa society of solid waste operators.
  - e. Four members of the general assembly with not more than one member from each chamber being from the same political party. The two senators shall be designated by the president of the senate after consultation with the majority and minority leaders of the senate. The two representatives shall be designated by the speaker of the house of representatives after consultation with the majority and minority leaders of the house of representatives.
3. By January 1, 2003, the task force shall submit a report to the general assembly, including recommendations, regarding issues relating to the disposal of debris from demolition sites in Iowa.

## APPENDIX 2

### AMOUNT AND TYPE OF CONSTRUCTION & DEMOLITION DEBRIS LANDFILLED IN IOWA ANNUALLY

#### C&D Debris Tons Landfilled by Type

(Total Tons = 405,693)



## Planning Areas, MSW and C&D Landfills



## APPENDIX 4

### ULTIMATE AND PERMITTED CAPACITY AND TIPPING FEES OF IOWA LANDFILLS

Landfill	Tip Fee	C&D Price	Ultimate Capacity	Permitted Capacity
ADAIR - ADAIR COUNTY SANITARY LANDFILL	\$34.00	\$34.00	55-60 yrs	55-60 yrs
AUDUBON - AUDUBON COUNTY SANITARY LANDFILL	\$45.00	\$45.00	21 yrs	
BENTON - BENTON COUNTY SANITARY LANDFILL	-	\$40.00	40 yrs	14 yrs
BLACK HAWK- BLACK HAWK COUNTY SANITARY LANDFILL	\$25.00	\$33.25	55 yrs	55 yrs
BOONE - BOONE COUNTY SANITARY LANDFILL	\$26.00	\$26.00	60 yrs	40 yrs
BREMER - BREMER COUNTY SANITARY LANDFILL	\$35.75	\$35.75	15-20 yrs	15-20 yrs
BUENA VISTA - BUENA VISTA COUNTY SANITARY LANDFILL	\$37.00	\$37.00	8 yrs	8 yrs
CARROLL - CARROLL COUNTY SANITARY LANDFILL/RECYCLING	\$34.75	\$34.75	40 yrs	5 yrs
CASS - CASS COUNTY SANITARY LANDFILL	\$60.00	\$60.00	20-22 yrs	20-22 yrs
CERRO GORDO - LANDFILL OF NORTH IOWA	\$25.00	\$25.00	70 yrs	4-5 yrs
CHEROKEE - CHEROKEE COUNTY SANITARY LANDFILL	\$36.00	\$34.00	40 yrs	10 yrs
CLARKE - CLARKE COUNTY SANITARY LANDFILL-SOUTH SIDE	\$35.00	\$35.00	22.1 yrs	22.1 yrs
CLINTON - CLINTON COUNTY SANITARY LANDFILL-EAST	\$44.00	\$44.00		
CRAWFORD - CRAWFORD COUNTY SANITARY LANDFILL	\$35.00	\$35.00	40 yrs	40 yrs
DALLAS - NORTH DALLAS COUNTY SANITARY LANDFILL	\$28.00	\$28.00	30 yrs	30 yrs
DALLAS - SOUTH DALLAS COUNTY SANITARY LANDFILL	\$36.00	\$30.00		
DECATUR - WAYNE-RINGGOLD-DECATUR COUNTY SANITARY LF	\$25.50	\$25.50	7-8 yrs	6-7 yrs
DES MOINES - DES MOINES COUNTY SANITARY LANDFILL	\$30.00	\$23.50	100 yrs	50 yrs
DICKINSON - DICKINSON COUNTY SANITARY LANDFILL	\$37.65	\$37.50	50.3 yrs	25 yrs
DUBUQUE - DUBUQUE METROPOLITAN SANITARY LF	\$29.73	\$-	37 yrs	7 yrs
FAYETTE - FAYETTE COUNTY SANITARY LANDFILL	\$45.60/person/yr	\$41.70	20 yrs	2.5 yrs
FREMONT - FREMONT COUNTY SANITARY LANDFILL	\$35.00	\$35.00	20 yrs	20 yrs
GRUNDY - GRUNDY COUNTY SANITARY LANDFILL	\$45.00	\$30.00	8 yrs	8 yrs
HAMILTON - HAMILTON COUNTY SANITARY LANDFILL	\$45.00	\$45.00	20 yrs	20 yrs
HARDIN - RURAL IOWA SANITARY LANDFILL	\$35.00	\$35.00	80 yrs	80 yrs
HARRISON - HARRISON COUNTY SANITARY LANDFILL	\$35.00	\$20.00	70 yrs	61 yrs
IDA - IDA COUNTY SANITARY LANDFILL	\$30.00	\$30.00	6-6.5 yrs	6-6.5 yrs
IOWA - IOWA COUNTY SANITARY LANDFILL	\$40.00	\$40.00	50-60 yrs	50 yrs
JASPER - CITY OF NEWTON SANITARY LANDFILL	\$34.00	\$34.00	110 yrs	10 yrs
JOHNSON - CITY OF IOWA CITY SANITARY LANDFILL	\$38.50	\$38.50	17 yrs	17 yrs
JONES - JONES COUNTY SANITARY LANDFILL	\$40.00	\$-	13 yrs	13 yrs
KEOKUK - SOUTHEAST MULTI-COUNTY SANITARY LANDFILL	\$25.00	\$25.00	100 yrs	10 yrs
KOSSUTH - KOSSUTH COUNTY SANITARY LANDFILL	\$25.00	\$-	15 yrs	15 yrs
LEE - GREAT RIVER REGIONAL WASTE AUTHORITY	\$30.00	\$25.75	45 yrs	6 yrs
LINN - BLUESTEM (SITE #1-CR) SOLID WASTE AGENCY	\$35.00	\$35.00	4-7 yrs	4-7 yrs
LINN - BLUESTEM (SITE #2-MARION) SOLID WASTE AGENCY	\$35.00	\$35.00	4-7 yrs	4-7 yrs
MADISON - SOUTH CENTRAL IOWA SANITARY LANDFILL	\$22.50	\$22.50	60 yrs	30 yrs
MAHASKA - MAHASKA COUNTY SANITARY LANDFILL	\$16.25	\$16.25		37.8 yrs
MARION - SOUTH CENTRAL IOWA SOLID WASTE AGENCY	\$22.00	\$22.00	100 yrs	
MARSHALL - MARSHALL COUNTY SANITARY LANDFILL	\$52.00	\$52.00	70-80 yrs	70-80 yrs
MILLS - LOESS HILLS REGIONAL SANITARY LANDFILL	\$36.00	\$36.00	120 yrs	120 yrs
MITCHELL - FLOYD-MITCHELL COUNTY SANITARY LANDFILL	\$28.00	\$28.00	85 yrs	
MONTGOMERY - MONTGOMERY COUNTY SANITARY LANDFILL	\$48.70	\$48.70	100 yrs	30 yrs
MUSCATINE - MUSCATINE COUNTY SANITARY LANDFILL	\$38.00	\$38.00		
PAGE - PAGE COUNTY SANITARY LANDFILL	\$50.00	\$50.00	10 yrs	10 yrs
PALO ALTO - NORTHERN PLAINS	\$17.27	\$30.00	40 yrs	9 yrs
POLK - METRO PARK EAST SANITARY LANDFILL	\$31.00	\$31.00	30 yrs	2 yrs
APPANOOSE,RATHBUN AREA SOLID WASTE COMM	\$41.00	\$41.00	8-10 yrs	8-10 yrs
SAC - SAC COUNTY SANITARY LANDFILL	\$30.00	\$30.00	30 yrs	30 yrs

SCOTT - SCOTT AREA SANITARY LANDFILL	\$33.00	\$-	45 yrs	15 yrs
SIOUX - NORTHWEST IOWA AREA SANITARY LANDFILL	\$15.70	\$15.70	25-30 yrs	25-30 yrs
TAMA - TAMA COUNTY SANITARY LANDFILL	\$30.00	\$30.00	3-5 yrs	3-5 yrs
UNION - UNION COUNTY SANITARY LANDFILL	\$31.00	\$31.00		
WAPELLO - OTTUMWA-WAPELLO COUNTY SANITARY LF	\$48.00	\$30.00	52 yrs	6.5 yrs
WEBSTER - NORTH CENTRAL IOWA REGIONAL SANITARY LF	\$15.00	\$-	15 yrs	5 yrs
WINNEBAGO - CENTRAL DISPOSAL LANDFILL	\$32.25	\$32.25	50-60 yrs	3-5 yrs
WINNESHIEK - WINNESHIEK COUNTY SANITARY LANDFILL	\$51.00	\$51.00	20 yrs	
WOODBURY - CITY OF SIOUX CITY SANITARY LANDFILL	\$24.67	\$-	100 yrs	
WOODBURY - WOODBURY COUNTY SANITARY LANDFILL	\$20.00	\$20.00	2 yrs	2 yrs
Ames Story Environmental CandD Landfill		\$35.00	2-5 yrs	2-5 yrs
Anderson Excavating CandD Landfill				
Monona County Sanitary Landfill		\$2.50/cu.yd.		
Plymouth County Sanitary Landfill		\$22.00	40 yrs	5 yrs

# APPENDIX 5

## SUMMARY OF OTHER STATES' REQUIREMENTS FOR TRAINING FIRES AND BURNING STRUCTURES

Compiled by: Dave Cretors, Recycle Iowa/IDED, 515-242-4940, [david.cretors@ided.state.ia.us](mailto:david.cretors@ided.state.ia.us) on October 2, 2002.

### *General Conclusions from Ten (10) Responding States:*

1. Structures slated for firefighter training must follow National Emission Standard for Hazardous Air Pollutants (NESHAP) requirements for removal of asbestos material.
2. If evidence of asbestos is present in an already demolished/collapsed structure, all or portions of the structure may be subject to removal as asbestos contaminated material.
3. All hazardous waste materials must be removed.
4. In states whose laws don't specifically address the issue of standing vs. demolished structures, the general language in guidance documents tends to be written in reference to standing structures.
5. In general, all states that responded require firefighter training fires to be approved by an appropriate state agency (i.e. Air Quality, DNR, Fire Marshall).
6. Some states specifically require firefighters to adhere to national guidelines for training fires (*i.e. MO, KY, MN*):

#### ➤ **National Fire Protection Association (NFPA 1403):**

##### **Live Fire Training Evolutions in Structures**

This standard establishes procedures for training structural firefighters under live fire conditions.

Requirements include:

- training center burn buildings that are properly procured and prepared
- adequate water supply and room for vehicle parking and staging
- a pre-burn briefing session
- use of fuels that have known, controllable burning characteristics
- presence of a safety officer
- use of a fireground communications system, a building evacuation plan, backup safety personnel, emergency medical services and a pre-burn search
- use of full protective clothing and equipment.

#### ➤ **What Are NFPA Standards?**

Consensus standards are developed by specific industries to set forth widely accepted standards of care and operations for certain practices. Standards are an attempt by the industry or profession to self-regulate by establishing minimal operating, performance, or safety standards, and they establish a recognized standard of care. They are written by consensus committees composed of industry representatives and other affected parties. The NFPA has many standards, which affect fire departments. The standards should be followed to protect fire and rescue personnel from unnecessary workplace hazards and because they establish the standard of care that may be used in civil lawsuits against fire and rescue departments.

### **Missouri**

1. Missouri rules do not specifically address the burning of demolished, non-standing structures for firefighter training, however general demolition waste is prohibited from being open burned.
2. Fires set for training purposes must be conducted in strict accordance with National Fire Protection Association (NFPA) 1403 Standard on Live Fire Training Evolutions in Structures.
3. Carpeting, petroleum-based products/materials such as asphalt shingles, floor tiles, and ceiling tiles must be removed prior to a training burn.
4. Some metropolitan areas require additional permitting from local agencies.

### **North Dakota**

1. North Dakota rules do not specifically address the burning of demolished, non-standing structures for firefighter training.
2. A reasonable attempt must be made to remove oil, rubber, appliances, lead batteries, chemicals, garbage, asphalt shingles and other materials prior to a training burn

### **Minnesota**

1. Minnesota rules do not specifically address the burning of demolished, non-standing structures for firefighter training but prohibit the general burning of demolition material.
2. **88.171 Open burning prohibitions.**

#### Subdivision 2.

No person shall conduct, cause, or permit open burning of rubber, plastics, chemically treated materials, or other materials which produce excessive or noxious smoke including, but not limited to, tires, railroad ties, chemically treated lumber, composite shingles, tar paper, insulation, composition board, sheetrock, wiring, paint, or paint filters. The commissioner may allow burning of prohibited materials when the commissioner of health or the local board of health has made a determination that the burning is necessary to abate a public health nuisance.

3. **88.17 Permission to start fires; prosecution for unlawfully starting fires.**

#### Subdivision 3.a.

A permit to start a fire for the instruction and training of firefighters, including liquid fuels training, may be given by the commissioner or agent of the commissioner. Except for owners or operators conducting fire training in specialized industrial settings pursuant to applicable federal, state, or local standards, owners or operators conducting open burning for the purpose of instruction and training of firefighters with regard to structures must follow the techniques described in a document entitled: Structural Burn Training Procedures for the Minnesota Technical College System.

### **Nebraska**

1. Nebraska rules do not specifically address the burning of demolished, non-standing structures for firefighter training, however the Open Fires regulations do not allow for the burning of construction/demolition debris.

### **Colorado**

1. Colorado rules do not specifically address the burning of demolished, non-standing structures for firefighter training, however, rules discourage the open burning of demolition waste.
2. Floor tiles and shingles must be removed for training fires.

### **Pennsylvania**

1. Pennsylvania rules do not specifically provide for the burning of demolished, non-standing structures for firefighter training, however, open burning of demolition waste, insulation, etc is considered improper disposal of solid waste.

### **Illinois**

1. Illinois requires that structures slated for fire training be standing and that legitimate firefighter training take place. Demolished buildings may not be burned.
2. The Illinois Historic Preservation Agency must inspect structures prior to a training fire and conclude that the structure has no historic value.

### **Kentucky**

1. The burning of structures where NFPA 1403 standards are not followed, burning for purposes of urban renewal or inexpensive disposal are not considered bonafide fire training and would be in violation of Kentucky law (401 KAR 63:005).
2. One live burn of a structure per ten (10) firefighters per year is considered acceptable and adequate. In the event more than ten firefighters are to be trained in one exercise, multiple structure may be burned provided the fire department can demonstrate that the burning is not associated with an urban renewal project, and provided not more than one structure is burned per day of training.
3. All shingles must be removed.

### **Wisconsin**

1. Wisconsin DNR states:  
"Structures slated for fire training must have value (*i.e. be standing*) otherwise it is just waste disposal/open burning and is NOT allowed. If firefighters want to train on piles of stuff we recommend they stack up pallets of wood and let them burn to get heat exposure and training on fires. The purpose of fire-training is to allow the fire-fighters experience in standing structures so that they are somewhat accustomed to entering and fighting a fire in a burning structure."
2. If Fire Departments are burning without training, it is considered solid waste treatment and is a violation of state law.
3. WI DNR and Air Quality Departments are joining forces to encourage multi-departmental fire trainings rather than individual. This helps to reduce the number of burns and forces better use of the structure for training purposes.

### **Vermont**

1. Structures must be standing and suitable for Self Contained Breathing Apparatus interior training.
2. Structures that have been razed and are on the ground are not considered appropriate for bona fide fire training and must be disposed of properly as required for any demolition waste.
3. Structures slated for fire training are required to be stripped of non-wood materials (carpeting, linoleum, shingles, curtains, plastics, appliances, and mercury containing materials) to the greatest extent possible.

## APPENDIX 6

### EXAMPLE OF A PERMIT FEE STRUCTURE ENCOURAGING WASTE REDUCTION AND RECYCLING

Sample Construction and Demolition Debris Recycling Documents

#### **Atherton: Ordinance No. 506**

#### **An Ordinance of the Town of Atherton Adding a New Chapter 15.52 to the Atherton Municipal Code, Relating to Recycling and Diversion of Construction and Demolition Debris**

##### **Chapter 15.52 - Recycling and Diversion of Debris from Construction and Demolition**

**15.52.010 Findings and Purpose** - The City Council of the Town of Atherton hereby finds and determines that the Town is committed to protecting the public health, safety, welfare and environment; that in order to meet these goals it is necessary that the Town promote the reduction of solid waste and reduce the stream of solid waste going to landfills; that under California law as embodied in the California Waste Management Act (California Public Resources Code Sections 40000 et seq.), Atherton is required to prepare, adopt and implement source reduction and recycling elements to reach reduction goals, and is required to make substantial reductions in the volume of waste materials going to landfill, under the threat of penalties of \$10,000 per day; that debris from demolition and construction of buildings represents a large portion of the volume presently coming from Atherton, and that much of said debris is particularly suitable for recycling; that Atherton's commitment to the reduction of waste and to compliance with state law requires the establishment of programs for recycling and salvaging construction and demolition materials; the City Council recognizes that requiring demolition and construction debris to be recycled and reused may in some respects add modestly to the cost of demolition and in other respects may make possible some cost recovery and cost reduction; and that it is necessary in order to protect the public health, safety and welfare that the following regulations be adopted.

**15.52.020 Definitions** - For purposes of this chapter the following definitions apply:

- A. "Contractor" means any person or entity holding, or required to hold, a contractor's license of any type under the laws of the State of California, or who performs (whether as contractor, subcontractor or owner-builder) any construction, demolition, remodeling, or landscaping service relating to buildings or accessory structures in Atherton.
- B. "Construction" means all building, landscaping, remodeling, addition, removal or destruction involving the use or disposal of Designated Recyclable and Reusable Materials as defined in paragraph D below.
- C. "Demolition and Construction Debris" means:
  - 1. Discarded materials generally considered to be not water soluble and non-hazardous in nature, including but not limited to steel, glass, brick, concrete, asphalt material, pipe, gypsum, wallboard, and lumber from the construction or destruction of a structure as part of a construction or demolition project or from the renovation of a structure and/or landscaping, and including rocks, soils, tree remains, trees, and other vegetative matter that normally results from land clearing, landscaping and development operations for a construction project.
  - 2. Clean cardboard, paper, plastic, wood, and metal scraps from any construction and/or landscape project.
  - 3. Non-construction and demolition debris wood scraps.
  - 4. De-minimis amounts of other non hazardous wastes that are generated at construction or demolition projects, provided such amounts are consistent with best management practices of the industry.
  - 5. Mixing of construction and demolition debris with other types of solid waste will cause it to be classified as other than construction and demolition debris.
- D. "Designated Recyclable and Reusable Materials" means:
  - 1. Masonry building materials including all products generally used in construction including, but not limited to asphalt, concrete, rock, stone and brick.
  - 2. Wood materials including any and all dimensional lumber, fencing or construction wood that is not chemically treated, creosoted, CCA pressure treated, contaminated or painted.

3. Vegetative materials including trees, tree parts, shrubs, stumps, logs, brush or any other type of plants that are cleared from a site for construction or other use.
4. Metals including all metal scrap such as, but not limited to, pipes, siding, window frames, door frames and fences.
5. Roofing Materials including wood shingles as well as asphalt, stone and slate based roofing material.
6. Salvageable Materials includes all salvageable materials and structures Including, but not limited to wallboard, doors, windows, fixtures, toilets, sinks, bath tubs and appliances.

**15.52.030 Deconstruction and Salvage and Recovery** - Every structure planned for demolition shall be made available for deconstruction, salvage and recovery prior to demolition. It shall be the responsibility of the owner, the general contractor and all subcontractors to recover the maximum feasible amount of salvageable designated recyclable and reusable materials prior to demolition. Recovered and salvaged designated recyclable and reusable materials from the deconstruction phase shall qualify to be counted in meeting the diversion requirements of this chapter. Recovered or salvaged materials may be given or sold on the premises, or may be removed to reuse warehouse facilities for storage or sale. Title to recyclable materials forwarded to the operator of recycling facilities or of a landfill that is under contract to the cities in southern San Mateo County will transfer to the service provider upon departure of materials from the site.

**15.52.040 Diversion Requirements** - It is required that at least the following specified percentages of the waste tonnage of demolition and construction debris generated from every demolition, remodeling and construction project shall be diverted from going to land fill by using recycling, reuse and diversion programs:

Demolition:

Fifty percent (50%) of waste tonnage including concrete and asphalt, and fifteen percent (15%) of waste tonnage excluding concrete and asphalt.

Reroofing of homes with shingles or shakes as a separate project:

Fifty percent (50%) of waste tonnage.

Construction and Remodeling:

Fifty percent (50%) of waste tonnage.

Separate calculations and reports will be required for the demolition and for the construction portion of projects involving both demolition and construction.

**15.52.050 Information Required Before Issuance of Permit** - Every applicant shall submit a properly completed "Recycling and Waste Reduction Form", on a form as prescribed by the Building Department, to the Building Department, as a portion of the building or demolition permit process. The form shall contain an accurate estimate of the tonnage or other specified units of construction and/or demolition debris to be generated from construction and demolition on the site. Approval of the form as complete and accurate shall be a condition precedent to issuance of any building or demolition permit.

**15.52.060 Deposit Required** - As a condition precedent to issuance of any permit for a building or a demolition permit that involves the production of solid waste destined to be delivered to a landfill, the applicant shall post a cash deposit in the amount of fifty dollars (\$50.00) for each estimated ton of construction and/or demolition debris, but not less than five thousand dollars (\$5,000.00). The deposit or cash bond shall be returned, without interest, in total or in proportion, upon proof to the satisfaction of the building official, that no less than the required percentages or proven proportion of those percentages of the tons of debris generated by the demolition and /or construction project have been diverted from landfills and have been recycled or reused. If a lesser percentage of tons or cubic yards than required is diverted, a proportionate share of the deposit will be returned. The deposit shall be forfeited entirely or to the extent that there is a failure to comply with the requirements of this chapter.

**15.52.070 Administrative Fee** - As a condition precedent to issuance of any permit for a building or a demolition permit that involves the production of solid waste destined to be delivered to a landfill, the applicant shall pay to the Town a cash fee sufficient to compensate the Town for all expenses incurred in administering the permit. The amount of this fee shall be determined in accordance with the then current resolution of the City Council determining the same.

**15.52.080 On Site Practices** - During the term of the demolition or construction project, the contractor shall recycle or divert the required percentages of materials, and keep records thereof in tonnage or in other measurements approved by the Building Department that can be converted to tonnage. The Building department will evaluate and monitor each project to gauge the percentage of materials recycled, salvaged and disposed from the project. The required diversion of a minimum of the required percentages of the demolition and construction debris will be measured separately with respect to the demolition segment and the construction segment of a project where both demolition and construction are involved. To the maximum extent feasible on-site separation of scrap wood and clean green waste in a designated debris box or boxes shall be arranged, in order to permit chipping and mulching for soil enhancement or land cover purposes. In order to protect chipping and grinding machinery, metal and other materials which cannot be chipped or ground shall not be placed in such boxes. On-site separation shall be undertaken for wallboard to the extent feasible on new construction.

**15.52.090 Reporting** - Within sixty (60) days following the completion of the demolition project, and again within sixty (60) days following the completion of the construction project, the contractor shall, as a condition precedent to final inspection and to issuance of any certificate of occupancy, submit documentation to the Building Department which proves compliance with the requirements of Section 15.52.040. The documentation shall consist of a final completed "Recycling and Waste Reduction Form" showing actual data of tonnage of materials recycled and diverted, supported by originals or certified photocopies of receipts and weight tags or other records of measurement from recycling companies, deconstruction contractors and/or landfill and disposal companies. Receipts and weight tags will be used to verify whether materials generated from the site have been or are to be recycled, reused, salvaged or otherwise disposed of. If a project involves both demolition and construction, the report and documentation for the demolition project must be submitted and approved by the Building Department before issuance of a building permit for the construction project. In the alternative, the permittee may submit a letter stating that no waste or recyclable materials were generated from project, in which case this statement shall be subject to verification by the Building Department. Any deposit posted pursuant to Section 15.52.060 shall be forfeited if the permittee does not meet the timely reporting requirements of this section.

**15.52.100 Violation a Public Nuisance** - Each violation of the provisions of this chapter shall constitute a public nuisance and be subject to abatement as such, pursuant to the provisions of Chapter 8.20 of this Code. The costs of abatement of any such nuisance shall be a lien upon the property involved.

**15.52.110 Penalties** - Each violation of the provisions of this chapter shall constitute a misdemeanor, and shall be punishable by imprisonment in the county jail for not to exceed six (6) months, or by fine not exceeding one thousand dollars (\$1,000.00), or by both such fine and imprisonment. Each day that a violation continues shall be deemed a new and separate offense."

Section 2. Except as hereby amended, said Atherton Municipal Code as amended shall be and remain in full force and effect.

Section 3. If any section, subsection, sentence, clause, phrase, or portion of this ordinance or the application thereof to any person or circumstances is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct and independent provision and such holding shall not affect the validity of the remaining portions hereof nor other applications of the ordinance which can be given effect without the invalid provision or application, and to this end the provisions of this ordinance are declared to be severable.

Section 4. This Ordinance shall be posted in at least three public places within the Town of Atherton and shall be effective from and after thirty (30) days following its adoption.

## APPENDIX 7

### ASBESTOS POWERPOINT PRESENTATION BY MARION BURNSIDE, IOWA DNR, SEPTEMBER 5, 2002 - EXCERPTS

# ASBESTOS

MINERAL  
SILICA  
FIBER  
MICRON

## Asbestos-containing Materials

Asbestos used in 3600 Materials  
Banned in 1989  
Overturned in 1991  
Currently Asbestos used in 3000 Materials  
1997 United States Imported 47,000 tons of ACBM and 21,000 tons of Raw Asbestos

## ASBESTOS

- |   |   |
|---|---|
| <ul style="list-style-type: none"><li>• SERPENTINE</li><li>• Chrysotile</li></ul> | <ul style="list-style-type: none"><li>• AMPHIBOLE</li><li>• Amosite</li><li>• Crocidolite</li><li>• Anthophyllite (rare)</li><li>• Tremolite (rare)</li><li>• Actinolite (rare)</li></ul> |
|---|---|

## Regulations

- AHERA - EPA
- OSHA-Iowa Division of Labor
- NESHAP - DNR

## Carcinogen

- Fiber Size
- Mesothelioma
- Difficulty Breathing
- Lung Cancer
- Difficulty Breathing & Bloody Sputum
- Colon Cancer
- Passing Blood and Blockage

## AHERA

- Asbestos Hazard Emergency Response Act
- Schools and Public Buildings
- Asbestos Content of Building
- Management Plan

## OSHA

Occupational Health and  
Safety Administration

Worker Safety

## NOTIFICATION

Form must be completed and  
postmarked at least 10 working days  
prior to the start date given in the  
notification

## NESHAP

- National Emission Standards for  
Hazardous Air Pollutants

- Applicability
- Notification
- Emission Control

## Emission Control Procedures

1. All Regulated Asbestos-Containing  
Material must be removed using wet  
methods and disposed of in a wet  
condition prior to demolishing a  
facility.
2. No asbestos-containing debris or  
dust can remain.

## Applicability

AHERA inspector recommended

All suspect materials must be  
sampled and analyzed by Polarized  
Light Microscopy

U.S. EPA REGION 5 NEWS RELEASE

EPA Cites City of Detroit for Clean-air Violations

CHICAGO (August 16, 2002) — U.S. Environmental Protection Agency Region 5 has filed an administrative complaint against the city of Detroit's department of public works for alleged violations of federal regulations on asbestos, a hazardous air pollutant. EPA proposed a \$49,500 penalty.

EPA alleges the city of Detroit did not follow proper asbestos-removal procedures when city-owned properties were demolished at 12750 W. Grand River, 14845 Mack Ave., 21231 Fenkell St., 22351 Fenkell St., and 8042 Michigan Ave. Specifically, the city failed to give EPA prior written notification, to adequately remove all regulated asbestos-containing material before demolition, and to wet the material after removal.

The city has 30 days from receipt of the complaint to file an answer and request a hearing. It may request an informal conference with EPA at any time to discuss how to resolve the allegations.

Asbestos is a known cancer-producing substance that can cause mesothelioma, a type of lung cancer, and asbestosis, a lung disease, many years after exposure.

###

Iowa Department of  
Transportation Projects

Average cost per house for asbestos  
inspection and asbestos removal  
\$3500.00

## APPENDIX 8

### AIR QUALITY CONCERNS POWERPOINT PRESENTATION BY BRIAN BUTTON, IOWA DNR, SEPTEMBER 5, 2002

#### Air Awareness

- └ Most people ignore air
- └ Air is a substance that we consume  
1 gallons water v. 3,800 gallons air
- └ More toxic chemicals put into Iowa's air  
than our land and water combined.

2

#### Iowa's Air Quality

- └ Most days good to moderate air. But 4  
of 5 common pollutants found at  
unhealthy levels.
- └ Areas of Iowa up to 94% of allowed  
standards. Further deterioration means  
heightened clean up efforts and cost.
- └ Unhealthy air in Iowa every year--  
mainly particulate matter and ozone  
smog
- └ Concern about toxins

3

#### Open Burning

- └ Open burning contributes to particulate  
pollution
- └ Open burning contributes to ozone  
smog formation by releasing  
hydrocarbons

4

#### "Smoke"

- └ Smoke is particulate matter (PM)
- └ Microscopic soot particles 2.5 microns in  
size (PM2.5)
- └ About the thickness of a human red  
blood cell
- └ Dense concentrations visible as smoke  
or haze
- └ Remain airborne for several weeks

5

#### Particulate Matter and Health

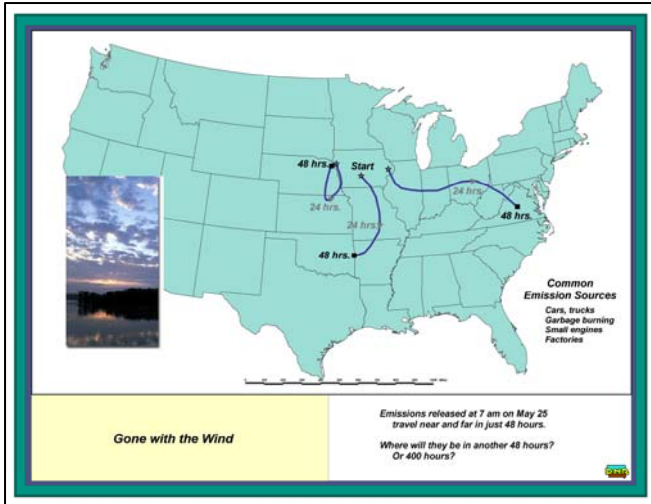
- └ Bypasses respiratory defenses
- └ Embeds deep in lung tissue
- └ Associated with:
  - premature death (15,000/yr.)
  - aggravated asthma
  - chronic bronchitis
  - decreased lung function

6

#### Burning: Why the concern?

- └ Dioxin and other toxins
- └ PAHs and HCBs
- └ Carbon monoxide
- └ Asthma, heart and respiratory health
- └ Haze/Odor/Nuisance
- └ Pollution Transport Issues

7



## At Risk or Sensitive Groups

- ▢ Children
- ▢ Athletes, active adults
- ▢ Persons with respiratory disease such as asthma
- ▢ The elderly

9

## Children

- ▢ Group highest at risk
- ▢ Asthma is the most common chronic disease for children
- ▢ Breathe more air per pound of body weight than adults
- ▢ Respiratory system still developing

10

## Respiratory Disease: Asthma

- ▢ Narrowing and chronic inflammation of lung passages marked by attacks of wheezing, coughing and shortness of breath.

11

## Asthma On the Rise

- ▢ From 1980-95, asthma has doubled.
- ▢ Most common chronic disease among children,
- ▢ Leading cause of school absenteeism
- ▢ Over 39,000 Iowa school kids with asthma. Over 50,000 children total.
- ▢ Visits to doctor offices more than doubled

12

## Asthma on the Rise

- ▢ Nearly 2 million emergency room visits
- ▢ Asthma deaths nearly tripled during past 20 years despite better medication
- ▢ Nearly 500,000 annual hospitalizations
- ▢ Asthma increased 160% 1980-94 for children under age five

13

## Asthma

- ┐ Unknown medical cause. Smoke is a known trigger for attack.
- ┐ Cannot be cured, but can be managed and controlled to reduce severity and frequency of attacks

14

## Asthma in Iowa

- ┐ Increase over last 10 years
- ┐ Goal of reducing open burning. Iowa Asthma Coalition; Healthy Iowans 2010
- ┐ Keokuk County School Children Study
  - 16.5% prevalence equals inner cities

15

Z

## Toxics

- ┐ More work needs to be done to reduce emissions and exposure in Iowa
- ┐ Illnesses can take many years to develop
- ┐ Some Iowa counties at 30 times the accepted long term exposure risk

16

## Open Burning--Major Source

- ┐ "Backyard burning" the nation's largest remaining dioxin source

17

## Toxic Health Effects

- ┐ Cancers, birth and genetic defects, may affect fetal growth and development of infants and children
- ┐ behavior, reproduction
- ┐ Reduced immune system function
- ┐ May affect central nervous system
- ┐ Liver diseases and other serious health complications

18

## Building Materials Toxic when Burned

- ┐ treated and manufactured lumber
- ┐ sealants, tarpaper, insulation
- ┐ shingles and roofing material
- ┐ coated wiring, rubber, tubing, plastics
- ┐ metals
- ┐ carpet/flooring/paneling
- ┐ glue, resins, varnishes, paint

19

## Toxins in the Environment

- Affect ecosystem, reproduction, viability of offspring. Mutations, deformities
- Fall into lakes, soils, and streams
- Buildup in plant & animal tissue: accumulate & magnify in food chain
- Harm humans: enters foodchain
- Persistence in air, soil, water for decades or centuries.

20

## Dioxin and Furans

- Produced by burning chlorine containing material like building waste, garbage
- 30 different dioxin-like compounds
  - highly toxic at extremely low levels
- “Backyard burning” the nation’s largest remaining dioxin source
- Dioxin uptake via meat and dairy. Rural burning deposits dioxin near fodder and fields. Food chain contamination.

21

## APPENDIX 9

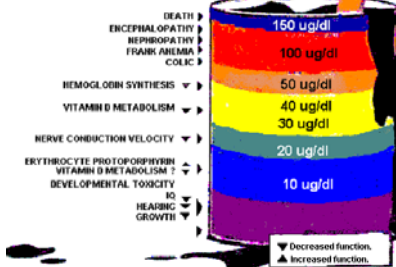
### LEAD-BASED PAINT PRESENTATION BY BRIAN MCPARTLAND, IOWA PUBLIC HEALTH, SEPTEMBER 5, 2002

Lead poisoning is one of the most common and preventable pediatric health problems today.

-Centers for Disease Control and Prevention

1

#### INORGANIC LEAD: The Lowest Observed Effects in Children



The chart shows the effects of lead contamination at various levels. The levels in the diagram do not necessarily indicate the lowest levels at which lead exerts an effect. These are the levels at which studies have adequately demonstrated an effect.

Source: CDC, 1990

© World Graphics

2

Most lead-poisoned children have no symptoms.

3

#### HOW LONG DOES LEAD STAY IN THE BODY?

- Lead initially shows up in the blood. If exposure stops, the turnover time for lead in blood is 30 to 60 days.
- If exposure continues, lead enters soft tissue (organs). If exposure stops, the turnover time for lead in soft tissue is 60 to 90 days.
- If exposure continues, lead enters bone. If exposure stops, the turnover time for lead in bones is approximately 40 years.

4

#### HOW DOES LEAD LEAVE THE BODY?

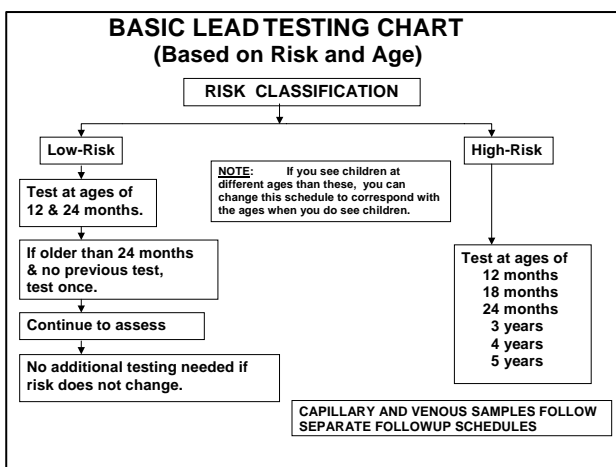
Most lead is excreted from the body through the kidneys.

5

#### SCREENING

1. CDC recommends that all children be screened for lead poisoning with a blood lead test.
2. Assess risk through questionnaire.
3. Screen high-risk children and low-risk children starting at age of 12 months.
4. Some children will be screened up to the age of 6 years.

6



## HOW ARE CHILDREN EXPOSED TO LEAD?

Children under the age of 6 years explore their environment with hands and their mouths. While they are doing this, they have the perfect opportunity to come in contact with lead-based paint chips and household dust containing lead.

Most childhood exposure to lead occurs when children put paint chips in their mouths or put their hands or toys that have lead dust on them in their mouths. Some children also put soil, rocks, etc., in their mouths.

8

## HOW ARE CHILDREN EXPOSED TO LEAD?

Children can also pick up lead dust off their parent's clothes if their parents work with lead on the job or have been removing lead-based paint around their home.

Children may inhale lead dust if they are in the immediate area when lead-based paint is being removed.

Aside from this, inhalation is not the usual route of exposure for children.

Children absorb up to 50% of the lead that they ingest.

9

## HOW ARE ADULTS EXPOSED TO LEAD?

- Adults can inhale lead dust and fumes when they work with lead in a job or hobby or if they are disturbing lead-based paint in an older home.
- Lead in the dust and fumes ends up on adults' hands, faces, and clothes. If adults working with lead eat, drink, or smoke before washing their hands and face, they will ingest lead dust.
- Adults absorb about 10% of the lead that they inhale and ingest.

10

## WHY ARE CHILDREN AT HIGHER RISK FOR LEAD EXPOSURE THAN ADULTS?

1. Children absorb more of the lead that they ingest than adults do.
2. Children ingest more lead through hand-to-mouth activity.

11

## WHEN IS LEAD-BASED PAINT A LEAD HAZARD?

1. If it is on an chewable, friction, or impact surface.

Chewable surface\*: window sill.

Friction surface: window track.  
(Evidence of friction or elevated dust levels nearby)

Impact surface: edge of door or door frame.  
(Evidence of impact or deterioration)

\*Differs from Federal definition. Federal definition says it has to have teeth marks to be considered an chewable surface.

12

## WHEN IS LEAD-BASED PAINT A LEAD HAZARD?

2. On all other surfaces, if it is loose, chipping, cracking, peeling, flaking, chalking, or otherwise deteriorating.

13

## STATE OF IOWA CHILDHOOD BLOOD LEAD DATA

CHILDREN BORN IN 1992-1996 AND TESTED  
BEFORE THE AGE OF 6 YEARS

- 75,601 children tested (40.4% of children in this group).
- Each child was counted once regardless of number of times tested.

15

## IOWA CHILDHOOD BLOOD LEAD DATA

CHILDREN BORN IN 1992-1996 AND  
TESTED BEFORE THE AGE OF 6 YEARS

CATEGORY	IOWA PREVALENCE	NHANES III PHASE 2
$\geq 10$ $\mu\text{g/dL}$	11.9%	4.4%
$\geq 15$ $\mu\text{g/dL}$	4.3%	1.3%
$\geq 20$ $\mu\text{g/dL}$	1.3%	0.4%
$\geq 25$ $\mu\text{g/dL}$	0.8%	0%

16

## LEAD-BASED PAINT

- Used mostly in homes built before 1960.
- Used on interior wood surfaces: windows, baseboards, doors, etc.
- Used on some interior walls, primarily in kitchens and bathrooms.
- Used on exterior wood surfaces: siding, porches, windows, doors.
- Highest quality paints ("white lead paint") had the highest amount of lead in them.

20

## NOTIFICATION PRIOR TO RENOVATION, REMODELING, OR REPAINTING

This rule went into effect on June 1, 1999. The provisions are similar to those of the real estate disclosure rule:

1. Affects "target housing".
2. The contractor (includes landlords) must give a standard notification and the EPA or a state-approved pamphlet prior to starting a renovation, remodeling, or repainting project.
3. Does not apply to abatement done by a certified abatement contractor.
4. Iowa is currently only state with EPA-authorized program, but other states are expected to follow.

21

## RESIDENTIAL LEAD ABATEMENT

Must be done a lead abatement contractor and lead abatement workers certified by IDPH.

IDPH regulations cover occupant protection and work practice standards to avoid contaminating the house or yard.

22

## WASTE MANAGEMENT

- Governed by federal RCRA (Resource Conservation and Recovery Act).
- In Iowa, this is administered by EPA Region VII.

23

## PAINT CHIPS, SOIL, AND BUILDING COMPONENTS PAINTING, REMODELING, OR ABATING A RESIDENCE

- Exempted from hazardous waste regulations under the RCRA household waste exclusion. (1995 & 2000 EPA Interpretations)
- Contractor must document that waste came households rather than commercial buildings or superstructures. If lead in soil is from source other than paint chips, must treat as hazardous waste.
- In Iowa, components may be disposed of at a solid waste landfill or at a construction and demolition landfill. (Other states' regulations may be different)
- Do not accumulate waste -- dispose as you go.
- Work with landfill in advance. Stress that waste comes from households.

24

## LEAD BASED PAINT WASTE FROM PUBLIC BUILDINGS

These buildings are not "households".

Household waste exemption does NOT apply.

Waste must be subjected to TCLP for lead. If it fails, it must go to a hazardous waste landfill.

25

## DEMOLITION OF RESIDENCES

Unclear whether household exemption applies to demolition of a residence. We have asked EPA for guidance on this issue, but have not received a response.

No federal regulations on burning buildings that contain lead-based paint. Little information about environmental contamination and/or health effects under these circumstances.

26

## WASTE WATER

(Example -- from cleaning after hazard control).

- Contact the local waste water treatment facility to see if special treatment is needed.
- Pour wastewater down toilet after any required pretreatment.
- NEVER dispose of waste water by pouring onto ground or pavement.

27

## APPENDIX 10

### “ASBESTOS CONTAINING MATERIALS,” EPA REGION 6 WEB PAGE, MARCH 2002

**Note:** The following list does not include every product/material that may contain asbestos. It is intended as a general guide to show which types of materials may contain asbestos.

#### Sample List of Suspect Asbestos - Containing Materials

Cement Pipes	Elevator Brake Shoes
Cement Wallboard	HVAC Duct Insulation
Cement Siding	Boiler Insulation
Asphalt Floor Tile	Breaching Insulation
Vinyl Floor Tile	Ductwork Flexible Fabric Connections
Vinyl Sheet Flooring	Cooling Towers
Flooring Backing	Pipe Insulation (corrugated air-cell, block, etc.)
Construction Mastics (floor tile, carpet, ceiling tile, etc.)	Heating and Electrical Ducts
Acoustical Plaster	Electrical Panel Partitions
Decorative Plaster	Electrical Cloth
Textured Paints/Coatings	Electric Wiring Insulation
Ceiling Tiles and Lay-in Panels	Chalkboards
Spray-Applied Insulation	Roofing Shingles
Blown-in Insulation	Roofing Felt
Fireproofing Materials	Base Flashing
Taping Compounds (thermal)	Thermal Paper Products
Packing Materials (for wall/floor penetrations)	Fire Doors
High Temperature Gaskets	Caulking/Putties
Laboratory Hoods/Table Tops	Adhesives
Laboratory Gloves	Wallboard
Fire Blankets	Joint Compounds
Fire Curtains	Vinyl Wall Coverings
Elevator Equipment Panels	Spackling Compounds

# APPENDIX 11

## “DISPERSION MODELING OF EMISSIONS FROM BURNING OF RESIDENTIAL STRUCTURES”

### IOWA DEPARTMENT OF NATURAL RESOURCES

Environmental Protection Division  
Air Quality Bureau  
Modeling Group

#### *M E M O R A N D U M*

**DATE:** 01/30/02  
**TO:** CHRISTINE PAULSON  
**FROM:** LORI HANSON  
**RE:** DISPERSION MODELING OF PM-10 AND CO EMISSIONS FROM THE BURNING OF DEMOLITION DEBRIS FROM RESIDENTIAL STRUCTURES  
**CC:** JIM MCGRAW, CHUCK CORELL, MARION BURNSIDE, DENNIS THIELEN

PM-10 and CO emissions from the burning of demolition debris from residential structures were evaluated with the most recent version of the EPA's Industrial Source Complex Short-Term 3 (ISCST3, dated 00101) dispersion model to determine if predicted exceedances of the applicable PM-10 and CO National Ambient Air Standards (NAAQS) would result. Because the National Emission Standards for Hazardous Air Pollutants (NESHAPS) for asbestos require that all asbestos be removed from dwellings with regulated amounts of asbestos containing material (ACM) prior to intentional burning, asbestos emissions were not evaluated. This memo summarizes the modeling methodology, model inputs and the model results.

#### **Modeling Methodology and Inputs**

Emissions from burning the demolition debris from residential structures are dependent on the amount of combustible structural material and combustible building contents. For this project, residential structures were assumed to be empty; no combustible building contents were considered in the modeling analysis. The amount of combustible structural material was determined to be 14.10 tons, based on the California Air Resources Board (CARB) estimate for combustible structural mass per square foot (16.3 lb/sq ft) and the 1999 median residence size (1730 square feet) from the U.S. Census Bureau. It was assumed that 100% of the structure would be burned.

The PM and CO emission factors for structural fires (10.8 and 60 lb/ton of material burned, respectively) were taken from the STAPPA/ALAPCO and EPA's Emission Inventory Improvement Program, Volume III: Chapter 18 (January 2001). According to this document, the PM emission factor was derived from the CARB Emission Inventory Procedural Manual, Vol. III: Methods for Assessing Area Source Emissions. The emission factor methodology listed in the above manual indicates that the PM from structural fires is 98% PM-10. Therefore, the modeled PM-10 emission rate was 98% of the calculated PM emission rate. The emission factors and resulting emission rates used in the modeling analysis are summarized in Table 1.

Per conversation with Randy Novak, Bureau Chief of the Fire Service Training Bureau, the average residential structure will completely burn in approximately four hours. Therefore, the 8-hour CO and the 24-hour PM-10 impacts were ratioed from the predicted 4-hour impacts.

The residential demolition debris was modeled using the area source algorithm in the ISCST3 model. Based on the CARB estimate for the average floor space per residence, the demolition debris from the residential structure was assumed to cover a 1200 square foot area. The typical height of the debris pile was assumed to be 15 feet based on previous observations by DNR staff of demolition piles and typical residential home heights.

Sequential hourly surface meteorological data, with concurrent mixing height data, from the Des Moines and North Omaha National Weather Service offices, respectively, for the period 1987 through 1991, were used in the modeling analysis. These meteorological data are considered to be representative of 24 central Iowa counties and were randomly picked for this analysis. Since it was assumed that intentional burning of residential structures would be conducted during daylight hours, only the 12-hour period from 6 a.m. to 6 p.m. was evaluated for each day of the meteorological data modeled.

Cartesian receptors with 25-meter spacing were used to predict concentrations of PM-10 and CO. The receptor grid extended out 1000 meters from the demolition debris for the PM-10 modeling analysis and 500 meters for the CO modeling analysis. The surrounding terrain elevations were assumed to be flat. The ISCST3 model was run using the EPA's regulatory default settings and rural dispersion coefficients were selected.

### **Model Analysis Results**

The 24-hour PM-10 NAAQS is  $150 \mu\text{g}/\text{m}^3$ . The 24-hour PM-10 standard is attained when the expected number of exceedances is less than or equal to one. Therefore, the ISCST3 model was used to predict the highest, second-highest PM-10 concentrations. The current statewide PM-10 default 24-hour background concentration is  $52 \mu\text{g}/\text{m}^3$ . This background concentration is based on monitored values from population based PM-10 monitors located across the state and accounts for natural sources of PM-10, local PM-10 sources not included in the modeling, and distant PM-10 sources that may be impacting the modeling domain. The total PM-10 ambient air quality is determined by adding the default background value to the highest, second-highest 24-hour PM-10 concentrations predicted by the ISCST3 model. The annual PM-10 NAAQS was not evaluated because predicted PM-10 concentrations from burning of residential structure would have a negligible impact over the time period of a year.

The worst-case predicted 24-hour PM-10 concentrations, PM-10 background values and distance to the worst-case concentrations are summarized in Table 2. Predicted concentrations of PM-10 are well above the PM-10 NAAQS for all five years of the meteorological data set, with the highest concentrations located between 30 and 55 meters from the center of the debris.

The 1-hour and 8-hour CO NAAQS are 40,000 and  $10,000 \mu\text{g}/\text{m}^3$ , respectively. Since the CO standards are not to be exceeded more than once per year, the highest, second-highest CO concentrations were predicted. Background values for CO are considered to be negligible in most non-urban areas and were therefore not included in the analysis. The worst-case predicted CO concentrations and distance to these concentrations are listed in Table 3. Predicted concentrations of CO for both the 1-hour and 8-hour averaging periods are well above the CO NAAQS for all five years of the meteorological data set. The highest CO concentrations for the 1-hour averaging period are located between 30 and 119 meters from the center of the debris; highest CO concentrations for the 8-hour averaging period are located between 30 and 55 meters from the debris.

Receptor location and concentration data from the modeling analyses were imported into a graphics program to create plots that show the extent of the predicted NAAQS exceedances for both PM-10 and CO for each year of meteorological data. The plots for the meteorological year showing predicted NAAQS exceedances farthest away from the burn site are provided in this report. Figure 1 shows the 1990 plot of the highest, second-highest predicted 24-hour PM-10 concentrations, including the background value. The bolded contour line indicates the extent of the predicted NAAQS exceedances. Exceedances of the PM-10 NAAQS are predicted to occur as far as one kilometer from the burn site.

Figures 2 and 3 are the 1990 plots for the highest, second-highest 1-hour and 8-hour predicted CO concentrations, respectively. Again, the bolded contour lines on each plot indicate the extent of the predicted NAAQS exceedances. Exceedances of the 1-hour CO NAAQS are predicted nearly 400 meters from the burn site. Exceedances of the 8-hour CO NAAQS are predicted to occur over 200 meters from the burn site.

## Other Considerations/Additional Analysis

Meteorological data from the Des Moines and North Omaha National Weather Service offices were randomly selected for this modeling exercise. There are nine other meteorological data sets that are considered to be representative of other areas of Iowa. Conducting this modeling analysis with other meteorological data sets could result in different years having the worst-case predicted concentrations and some changes in the location of the highest concentrations. However, the overall magnitude of the predicted concentrations and the maximum extent of the predicted NAAQS exceedances should change very little.

Because the emissions from burning demolition debris are dependent on the amount of structural material being burned, the size of the residence is an important variable. The above analysis was conducted with an average size residence (1730 square foot) based on U.S. Census Bureau data. Since the predicted concentrations are directly related to the emission rate, the impacts from a 1730 square foot residence were ratioed to a smaller (1200 square foot) residence in order to evaluate how the residence size would effect the extent of the predicted concentrations. Burning the smaller amount of structural material (1200 square foot) reduced the emission rates by approximately 30 percent.

The emission rates used to evaluate the 1200 square foot structure are listed in Table 5. Predicted concentrations of both pollutants still exceed the applicable NAAQS, however the extents of the predicted NAAQS exceedances are smaller. Figures 4, 5 and 6 show the extent of the predicted NAAQS exceedances for a 1200 square foot structure. Exceedances of the 24-hour PM-10 NAAQS are predicted as far as 800 meters from the burn site. Exceedances of the 1-hour and 8-hour CO NAAQS are predicted to occur nearly 250 and 100 meters from the burn site, respectively.

This modeling analysis was conducted using the least conservative methodology. It was assumed that only one residential structure would be burned during a 24-hour period and that the structure would be empty of any combustible contents. Even when the demolition debris from a single relatively small residence is burned, predicted concentrations of PM-10 exceed the PM-10 NAAQS within approximately 800 meters and predicted concentrations of CO exceed the CO NAAQS within 250 meters of the burn site.

## Recommendations

Results from this project indicate that demolition debris from residential structures that are 1700 square feet or smaller can be burned provided that only one structure is burned per day and that there is at least 0.6 miles distance downwind from the burn site to the nearest occupied residence. Residential structures larger than 1700 square feet should either be divided into smaller debris piles to be burned on different days or the debris should be delivered to a landfill.

Table 1. Emission Rate Summary for a 1730 Square Foot Structure

Pollutant	Emission Factor (lb/ton)	Combustible Material Burned (tons)	Duration of Fire (hours)	Emission Rate (lbs/hour)
PM	10.80	14.10	4	38.07
PM-10	10.58	14.10	4	37.31
CO	60.00	14.10	4	211.50

Table 2. Worst-case PM-10 Modeling Results

Year	Averaging Period	Predicted Concentration* ( $\mu\text{g}/\text{m}^3$ )	Background Concentration ( $\mu\text{g}/\text{m}^3$ )	Total Concentration ( $\mu\text{g}/\text{m}^3$ )	NAAQS ( $\mu\text{g}/\text{m}^3$ )	Distance from center of debris (meters)
1987	24-hour	1132.8	52	1184.8	150	35.5
1988	24-hour	1114.4	52	1163.4	150	35.5
1989	24-hour	1065.1	52	1117.1	150	35.5
1990	24-hour	1393.5	52	1445.5	150	55.3
1991	24-hour	1310.9	52	1362.9	150	30.6

\*The 24-hour predicted concentrations were determined by multiplying the highest, second-highest predicted 4-hour value by the number of hours for the debris to completely burn (4) and then divided by the total number of hours in the averaging period (24).

Table 3. Worst-case CO Modeling Results

Year	Averaging Period	Predicted Concentration* ( $\mu\text{g}/\text{m}^3$ )	Background Concentration ( $\mu\text{g}/\text{m}^3$ )	Total Concentration ( $\mu\text{g}/\text{m}^3$ )	NAAQS ( $\mu\text{g}/\text{m}^3$ )	Distance from center of debris (meters)
1987	1-hour	93,702.0	NA	93,702.0	40,000	119.4
	8-hour	19,264.6	NA	19,264.6	10,000	35.5
1988	1-hour	91,996.2	NA	91,996.2	40,000	63.5
	8-hour	18,951.7	NA	18,951.7	10,000	35.5
1989	1-hour	98,105.0	NA	98,105.0	40,000	82.4
	8-hour	18,113.1	NA	18,113.1	10,000	35.5
1990	1-hour	96,582.5	NA	96,582.5	40,000	69.2
	8-hour	23,697.6	NA	23,697.6	10,000	55.3
1991	1-hour	119,815.5	NA	119,815.5	40,000	30.6
	8-hour	22,294.4	NA	22,294.4	10,000	30.6

\*The 1-hour predicted concentrations are the highest, second-highest predicted values. The 8-hour predicted concentrations were determined by multiplying the highest, second highest 4-hour value by the number of hours for the debris to completely burn (4) and then divided by the total number of hours in the averaging period (8).

Table 5. Emission Rate Summary for a 1200 Square Foot Structure

Pollutant	Emission Factor (lb/ton)	Combustible Material Burned (tons)	Duration of Fire (hours)	Emission Rate (lbs/hour)
PM	10.80	9.78	4	26.41
PM-10	10.58	9.78	4	25.87
CO	60.00	9.78	4	146.70

## APPENDIX 12

### **“PARTICULATE MATTER – BACKGROUND AND HEALTH EFFECTS,” EPA REGION 9 WEB PAGE, 1996**

PLEASE VISIT [WWW.EPA.GOV/REGION09/AIR/BREATH96/PM10.HTML](http://WWW.EPA.GOV/REGION09/AIR/BREATH96/PM10.HTML) TO VIEW THE FIGURES REFERRED TO BELOW.

#### **EPA REGION 9: BREATHING EASIER 1996 PARTICULATE MATTER**

Air pollutants called “particulate matter” include dust, dirt, soot, smoke, and liquid droplets directly emitted into the air by sources such as factories, power plants, transportation sources, construction activity, fires, and windblown dust. Particulates are also formed in the atmosphere by condensation or transformation of emitted gases such as sulfur dioxide, nitrogen oxides, and volatile organic compounds into tiny droplets.

Based on studies of human populations exposed to high concentrations of particles (often in the presence of sulfur dioxide) and on laboratory studies of animals and humans, the major concerns for human health include effects on breathing and respiratory functions, aggravation of existing respiratory and cardiovascular disease, alterations in the body’s defense systems against foreign materials, damage to lung tissue, carcinogenesis and premature death. The major subgroups of the populations that appear likely to be most sensitive to the effects of particulate matter include individuals with chronic obstructive pulmonary cardiovascular disease, individuals with influenza, asthmatics, the elderly, and children. Particulate matter may injure crops, trees and shrubs, and may cause damage to metal surfaces, fabrics, etc. Fine particulates also impair visibility by scattering light and reducing the visual range in urban, rural, and wilderness areas. The haze caused by fine particles can diminish crop yields by reducing sunlight.

The current NAAQS for particulate matter was established in 1987. The particulate size measurement used, known as PM<sub>10</sub>, includes particles with an aerodynamic diameter of less than 10 microns. These smaller particles are most likely responsible for the adverse health effects on humans, because particles so small can reach the thoracic or lower regions of the respiratory tract. The PM<sub>10</sub> annual mean standard is 50 micrograms per cubic meter of air ( $\mu\text{g}/\text{m}^3$ ). The 24-hour standard is attained when the expected number of days per calendar year above 150  $\mu\text{g}/\text{m}^3$  is no more than one. EPA is currently reviewing recent health effects studies on fine particulates, and may revise the PM<sub>10</sub> NAAQS to focus on particles smaller than ten microns, possibly at 2.5 microns. In addition, EPA is considering standards for visibility impairment and regional haze, which may be part of the revised PM NAAQS or separate standards. A proposal is expected in November 1996 with final promulgation in June 1997.

#### **RECENT PM<sub>10</sub> AIR QUALITY IN REGION 9**

For the three-year period 1993-95, PM<sub>10</sub> was monitored at 298 sites in Region 9. Figure 2a shows the geographic distribution of PM<sub>10</sub> monitors throughout the Region.

The 42 PM<sub>10</sub> sites that violated the NAAQS during 1993-95 are shown on the map in Figure 2b. The “spikes” represent monitors with PM<sub>10</sub> levels in violation of the annual standard, and the height of each spike shows the annual mean concentration for the site. The triangles on the map show monitors that attained the annual standard but exceeded the 24-hour standard. The more serious PM<sub>10</sub> problem areas in Region 9 are in the South Coast Air Basin (Los Angeles area), San Joaquin Valley, Southeast Desert, and Great Basin Valley of California in addition to Reno, Las Vegas, Phoenix, and areas near the Mexican border.

#### **LONG-TERM PM<sub>10</sub> TRENDS**

PM<sub>10</sub> is the newest NAAQS pollutant to be measured, with data going back only to 1988 in most areas. Overall, PM<sub>10</sub> annual mean concentrations have decreased by 26% in Region 9, based on 156 monitoring sites operating from 1988 through 1995. This compares to a 20% decrease at 748 sites nationwide.

Figure 2c1 & Figure 2c2 show the PM10 trends for 22 areas in Region 9 from 1988 through 1995. For most of the areas, the number of days with high particulate pollution has decreased over time. For example, the number of days with excess pollution in the San Joaquin Valley decreased from 14 days in 1990 to 3 days in 1995. Likewise, Paul Spur, a town in Arizona, improved from 11 days above the standard in 1989 to none in 1995. Although Figure 2c1 & Figure 2c2 show general improvement in particulate trends, some areas have shown more bad-air days in 1995. It is important to note that daily particulate levels can fluctuate and these increases may not be indicative of longer term trends.

Figure 2d1 & Figure 2d2 show the trend in annual PM10 concentrations since 1988. For all areas, the trend is positive -- the annual mean particulate concentration has decreased. The nonattainment areas (with several long-term monitors) that had the largest percentage reduction in their annual mean concentration are:

<b>% Decrease in Concentration</b>	<b>Area</b>
-49%	Sacramento County
-36%	Coachella Valley, CA
-34%	South Coast
-33%	San Joaquin Valley
-28%	Las Vegas
-24%	Reno
-23%	Searles Valley, CA
-14%	PHOENIX

California's South Coast Air Basin has the largest long-term PM10 monitoring network, with 14 sites, and has shown an overall 34% reduction in annual mean concentrations between 1988 and 1995.

Updated: May 15, 1997

[www.epa.gov/region09/air/breath96/pm10.html](http://www.epa.gov/region09/air/breath96/pm10.html)

# **APPENDIX 13**

## **HISTORICAL PARTICULATE POLLUTION TRENDS IN IOWA, IOWA DNR SUMMARY, DECEMBER 16, 2002**

### **Historical Particulate Pollution Trends in Iowa**

Materials prepared for Demolition Debris Task Force by  
DNR Air Quality Bureau  
December 16, 2002

Iowa has been monitoring particulate air pollution for over thirty years. On the vast majority of days, air quality in the state falls into the good to moderate categories particulate pollution. It is difficult, however, to draw definitive conclusions about particulate trends over the years. This is because we have changed what, how and where we measure this pollutant. Furthermore, although our monitors can evaluate overall air quality in the state, they cannot adequately assess the health impacts from such localized activities as open burning.

#### **Changing Standards of Air Pollution**

We know that nationwide particulate emissions, overall, have declined since Congress passed the Clean Air Act in 1970. This drop in particulate pollution is largely attributed to better control of industrial pollution, as well as better emissions control technology on automobiles. We have also reduced the frequency of windblown dust because many farmers have adopted conservation tillage practices.

Thirty years ago, state regulators attempted to measure air quality by mounting “dust-fall buckets” on telephone poles and weighing the particulate contents at regular intervals. We then progressed to a weatherproofed vacuum cleaner apparatus with an airflow controller. This was the first particulate sampler that could actually determine the concentration of the particulate in the air. Since this sampler collected all sizes of dust particles, it was known as the “total suspended particulate” (or TSP) sampler. The US Environmental Protection Agency (EPA) required state regulators to use this device for determining compliance with its first set of health-based standards for particulate.

In the 1980s, health scientists discovered that the dust particles that were less than ten microns in diameter ( $PM_{10}$ ) caused the most serious health problems. In response to this, EPA rescinded its air quality standards for TSP in favor of new  $PM_{10}$  standards. EPA developed a new air sampler that could separate out  $PM_{10}$ , and directed states to use this sampler determine compliance the new standards. Iowa removed our TSP monitors in the late 1980's.

In recent years, health researchers found that extremely small particulate,  $PM_{2.5}$ , is the most unhealthy form of particulate pollution.  $PM_{2.5}$ , particulate less than 2.5 microns in diameter, is roughly the size of a human red blood cell, and can penetrate most of the lung's defenses. Thus, in 1999, EPA supplemented its  $PM_{10}$  standards with a new set of standards for  $PM_{2.5}$ . EPA asked states to implement the new standards by employing a new type of air sampler that captures only  $PM_{2.5}$ .

### **Iowa's Air Monitoring Network**

As the particulate pollution standards changed, so also have the monitor types and locations in Iowa. The Iowa Department of Natural Resources (DNR), along with two local air quality programs, operate particulate monitors in many Iowa cities and rural areas. These monitors are sited to determine representative particulate concentrations in populated areas, to assess high concentrations near industrial complexes, and to determine "background" concentrations in areas far away from sources.

The DNR places the majority of our air monitors near areas with the potential to exceed the national health standards. We also place "background" monitors in relatively remote, rural areas of the state to measure what pollutants are coming into Iowa. Thus, the "background" monitors are not necessarily measuring "clean," air, but merely what Iowa must consider to be a base level of pollution.

### **Iowa's Air Quality**

Because particulate measurement methods evolved along with the knowledge of particulate health effects, direct comparison of particulate levels over the past 30 years is not possible. We have only monitored PM<sub>2.5</sub> since 1999, so we cannot yet draw any conclusions about PM<sub>2.5</sub> trends in Iowa. We have, however, seen exceedances of the federal PM<sub>10</sub> health standard in Iowa, primarily in the eastern part of the state.

During the period from 1999 to 2001, the DNR monitored six exceedances of EPA's twenty-four hour standard for PM<sub>10</sub>, all near industrial complexes. There were no exceedances of EPA's twenty-four hour standard for PM<sub>2.5</sub>. Over this period, however, PM<sub>2.5</sub> exposures in the Davenport-Clinton-Muscatine areas were determined to be about 90 percent of EPA's annual PM<sub>2.5</sub> standard. Monitored daily levels of PM<sub>2.5</sub> also reached levels that EPA classifies as Unhealthy for Sensitive Groups (sensitive groups include children and the elderly) seventeen (17) times in eastern Iowa.

### **Air Quality Impacts from Burning Demolition Debris**

Air emissions from demolition burning contain particulate matter of all different sizes. Most of the large particles (greater than PM<sub>10</sub>) will probably fall out in the neighborhood where the burning occurs. The smaller particles will be dispersed by the wind in a dark plume, possibly causing unhealthy particulate levels for neighbors many blocks downwind. In fact, PM<sub>2.5</sub> emissions can travel great distances, and can become a regional problem. PM<sub>2.5</sub> is emitted almost exclusively from combustion sources, such as industrial boilers and open burning.

It is rare that monitors record high particulate levels due to demolition burning. This is to be expected, since the chance that a fixed monitoring site happens to be situated in the smoke plume of a burning building is small. Consequently, we cannot draw conclusions from our air monitoring networks about the impacts of open burning on local communities.

We do know that burning demolition debris releases harmful particulate emissions, carbon monoxide, and air toxics such as dioxin, furan, and benzo-pyrene. Air toxics are not only acutely harmful, but many also are suspected or proven cancer-causing compounds. Because of the risk to public health and welfare, the burning of construction and demolition waste should be minimized.

## APPENDIX 14

### AIR QUALITY INDEX (AQI) EXCEEDANCES IN IOWA, 1999-2001 AND 2001-2002.

#### AQI Exceedance Totals 1999-2001

Pollutant	1999	2000	2001	Totals
Ozone	11	4	1	16
PM2.5	4	2	11	17
PM10	3	3	0	6
SO2	1	0	0	1
CO	0	0	0	0
<b>Totals</b>	<b>19</b>	<b>9</b>	<b>12</b>	<b>40</b>

The full report is available online at [www.iowacleanair.com/current/files/aqi99-01.pdf](http://www.iowacleanair.com/current/files/aqi99-01.pdf).

#### AQI Exceedances January 2001 – September 2002

Monitor Type	Site Location	Site Name	Exceedance Date	Concentration	Units
PM2.5	Central Davenport	Jefferson Elementary	1/22/2001	52.2	ug/m3
<b>PM2.5</b>	Central Davenport	Adams Elementary	1/22/2001	50.3	ug/m3
<b>PM2.5</b>	Muscatine	Garfield Elementary	1/22/2001	52.5	ug/m3
<b>PM2.5</b>	Iowa City	Hoover Elementary	1/22/2001	49.8	ug/m3
<b>PM2.5</b>	Cedar Rapids	Army Reserve	1/22/2001	49.0	ug/m3
<b>PM2.5</b>	Cedar Rapids	Monroe Elementary	1/22/2001	48.4	ug/m3
<b>PM2.5</b>	Clinton	Rainbow Park	1/22/2001	49.4	ug/m3
<b>PM2.5</b>	Waterloo	Grout Museum	1/22/2001	55.0	ug/m3
<b>PM2.5</b>	Cedar Rapids	Army Reserve	3/30/2001	41.0	ug/m3
<b>PM2.5</b>	Muscatine	Garfield Elementary	4/4/2001	52.5	ug/m3
<b>Ozone</b>	Waverly	Airport	6/28/2001	87	ppb
<b>PM2.5</b>	Central Davenport	Jefferson Elementary	8/8/2001	40.7	.ug/m3
<b>PM10</b>	Mason City	17 <sup>th</sup> and Washington	2/26/2002	168	.ug/m3
<b>PM10</b>	Buffalo	Linwood Mining	3/24/2002	169	ug/m3
<b>Ozone</b>	Clinton	Rainbow Park	6/23/2002	94	ppb
<b>Ozone</b>	North Davenport	Argo	6/23/2002	94	ppb
<b>Ozone</b>	Davenport	Scott County Park	6/23/2002	94	ppb
<b>Ozone</b>	Pisgah	Pisgah	6/24/2002	86	ppb
<b>Ozone</b>	North Davenport	Argo	9/7/2002	93	ppb
<b>Ozone</b>	Davenport	Scott County Park	9/7/2002	102	ppb
<b>Ozone</b>	Southeast Iowa	Lake Sugema	9/7/2002	94	ppb

The full report is available online at [www.iowacleanair.com/current/files/new2002.pdf](http://www.iowacleanair.com/current/files/new2002.pdf).

## APPENDIX 15

### "LUNG CANCER, AIR POLLUTION" ASSOCIATED PRESS ARTICLE, MARCH 5, 2002

Health | Reuters | AP | HealthSCOUT

Lung Cancer, Air Pollution

Tue Mar 5, 5:29 PM ET

By LINDSEY TANNER, AP Medical Writer

CHICAGO - Long-term exposure to the air pollution in some of America's biggest metropolitan areas significantly raises the risk of dying from lung cancer and is about as dangerous as living with a smoker, a study of a half-million people found.

The study echoes previous research and provides the strongest evidence yet of the health dangers of the pollution levels found in many big cities and even some smaller ones, according to the researchers from Brigham Young University and New York University. The risk is from what scientists call combustion-related fine particulate matter — soot emitted by cars and trucks, coal-fired power plants and factories. The study appears in Wednesday's Journal of the American Medical Association.

It involved 500,000 adults who enrolled in 1982 in an American Cancer Society survey on cancer prevention. The researchers examined participants' health records through 1998 and analyzed data on annual air pollution averages in the more than 100 cities in which participants lived. The researchers first took into account other risk factors for heart and lung disease such as cigarettes, diet, weight and occupation.

Lung cancer death rates were compared with average pollution levels, as measured in micrograms per cubic meter of air. The researchers found that the number of lung cancer deaths increased 8 percent for every increase of 10 micrograms. Other heart- and lung-related causes of death increased 6 percent for every 10-microgram increase.

Allen Dearry, a scientist at the National Institute of Environmental Health Sciences, which funded the study, called it "the best epidemiologic evidence that we have so far that that type of exposure is associated with lung cancer death." "This study is compelling because it involved hundreds of thousands of people in many cities across the United States who were followed for almost two decades," said study co-leader George Thurston, an NYU environmental scientist.

Thurston said the lung cancer risks were comparable to those faced by nonsmokers who live with smokers and are exposed long-term to secondhand cigarette smoke. Such risks have been estimated at 16 percent to 24 percent higher than those faced by people living with nonsmokers, Thurston said.

In the early 1980s, when the study began, some major cities had air pollution levels of 25 to 30 micrograms per cubic meter, which would confer a more than 20 percent increased risk of lung

cancer mortality, said C. Arden Pope III, an environmental epidemiologist at Brigham Young University and a co-leader of the JAMA study.

The Environmental Protection Agency set average annual limits at 15 micrograms per cubic meter in 1997, when it tightened its standards to include fine particulate matter — pollutants measuring less than 2.5 micrometers. That is about 1/28th the width of a human hair. That regulation followed another study by Pope linking fine particulate pollution and lung cancer that included many of the same participants as the JAMA study.

Pope said the new study doubles the follow-up time and does a better job of taking other risk factors into account, to address criticism from industry groups who challenged the earlier study and sued the EPA over the 1997 regulations. The Supreme Court last year upheld the way the EPA set those standards.

Industry challenges to the standards are ongoing, said Jayne Brady, spokeswoman for the Edison Electric Institute, which represents most of the nation's major electric utilities, including operators of many coal-powered plants. Despite those challenges, Brady said, "We are trying to do everything we can to reduce emissions."

Thurston said annual fine-particulate pollutant averages have fallen significantly since the early 1980s but as of 1999-2000 were still at or above the EPA limit in such metropolitan areas as New York, Washington, Chicago and Los Angeles. He said the biggest sources of such pollution are coal-burning power plants in the Midwest and East, and diesel trucks and buses in the West.

Thurston said the study gives new impetus to efforts in Washington to clean up aging coal-fired power plants. The EPA said the agency will consider the research as part of its continuing review of air quality standards for particulate matter.

On the Net:

JAMA: <http://jama.ama-assn.org>

EPA: <http://www.epa.gov>

## **APPENDIX 16**

### **Links Between Air Pollution and Death Health Effects Institute report, October 24, 2000**

#### **“Association of Particulate Matter Components with Daily Mortality and Morbidity in Urban Populations”**

Morton Lippmann, Kazuhiko Ito, Arthur Nádas, and  
Richard T Burnett  
Number 95  
August 2000

Due to the thoroughness and length of this report, the report was not included in this document.  
To review the report in its entirety please visit [www.healtheffects.org/Pubs/Lippmann.pdf](http://www.healtheffects.org/Pubs/Lippmann.pdf).

# APPENDIX 17

## COMPARISON BETWEEN DEMOLITION AND DECONSTRUCTION COSTS

Costs	Demolition	Deconstruction	Deconstruction Savings	Deconstruction Savings as % of Demolition Costs	
Labor	\$1.74 (33%)	\$3.64 (56%)	- \$1.90	+35%	
Disposal	\$2.17 (40%)	\$0.97 (15%)	+\$1.20	- 22%	
Hazardous	\$0.97 (18%)	\$0.97 (15%)	\$0.00	0%	
Other	\$0.48 (9%)	\$0.89 (14%)	- \$0.41	+ 8%	
Total	\$5.36	\$6.47	- \$1.11	+21%	
Salvage	\$0.00	\$3.28/\$1.64	+\$3.28/\$1.64	-61-31%	
Net Costs	\$5.36	\$3.19/\$4.83	+\$2.17/\$0.53		

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On behalf of Alachua County Solid Waste Management Innovative Recycling Project, August, 2000

## APPENDIX 18

### TASK FORCE MEMBERS

Jerry Behn	Iowa Senate
Joe Bolkcom	Iowa Senate
Konni Cawiezell	Iowa League of Cities
Dave Cretors	IDED - Recycle Iowa
Jack Drake	Iowa House
Ed Fallon	Iowa House of Representatives
Jeff Geerts	DNR - Energy & Waste
Rita Gergely	Iowa Department of Public Health
Bill Gross	DNR - Field Office
Kathleen Moench	DNR - Legislative Liaison
Robert Mulqueen	Iowa State Association of Counties
Jeff Myrom	DNR - Energy & Waste
Christine Paulson	DNR - Air Quality
Joe Sanfilippo	DNR - Field Office
Scott Smith	Iowa Society of Solid Waste Operations
Brian Tormey	DNR - Energy & Waste
Wendy Walker	IDED - Air Quality Liaison